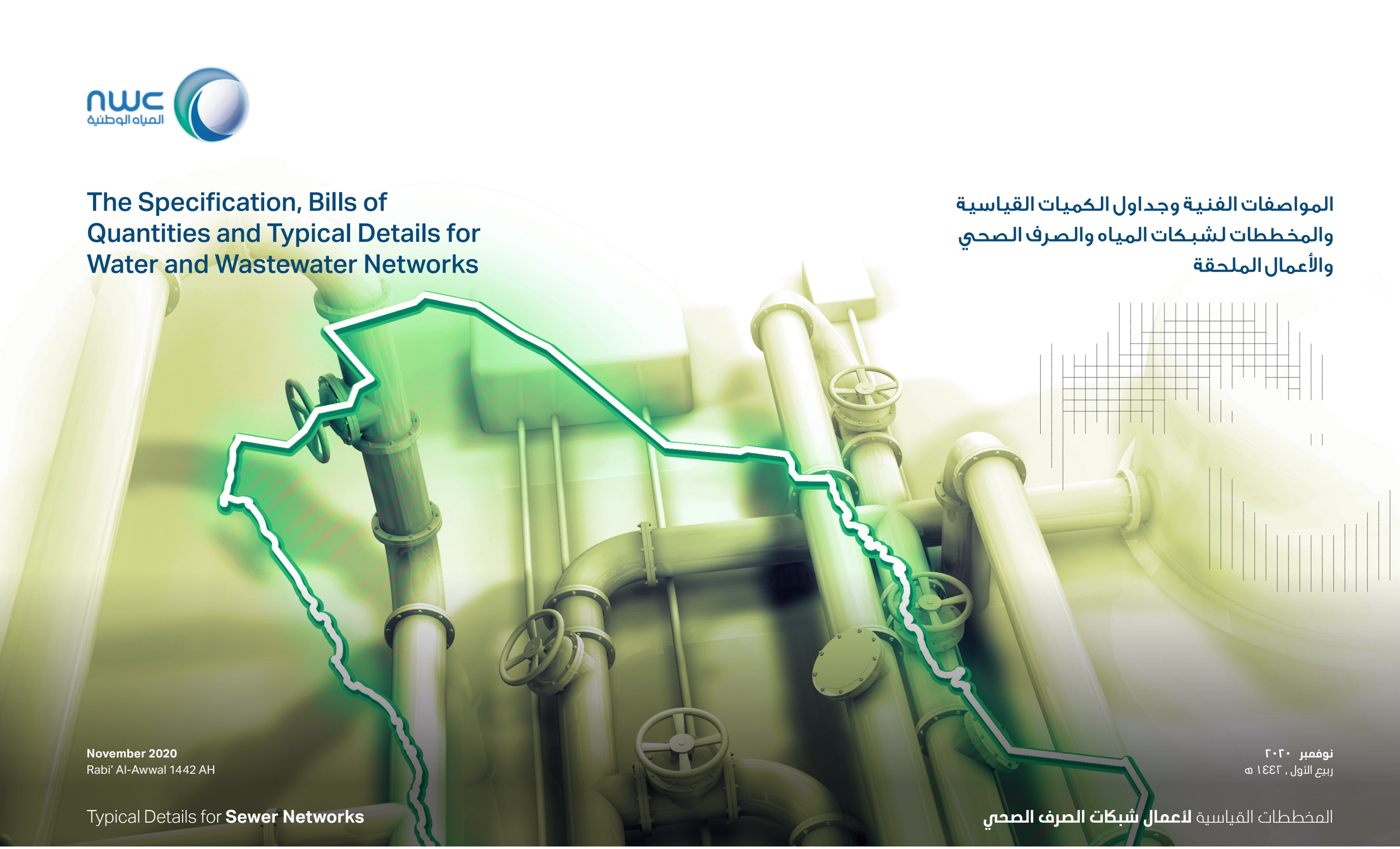
The Specification, Bills of Quantities and Typical Details for Water and Wastewater Networks

المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة



November 2020
Rabi' Al-Awwal 1442 AH

نوفمبر ٢٠٢٠
ربيع الأول , ١٤٤٢ هـ

Typical Details for **Sewer Networks**

المخططات القياسية **لأعمال شبكات الصرف الصحي**

dar

S19158

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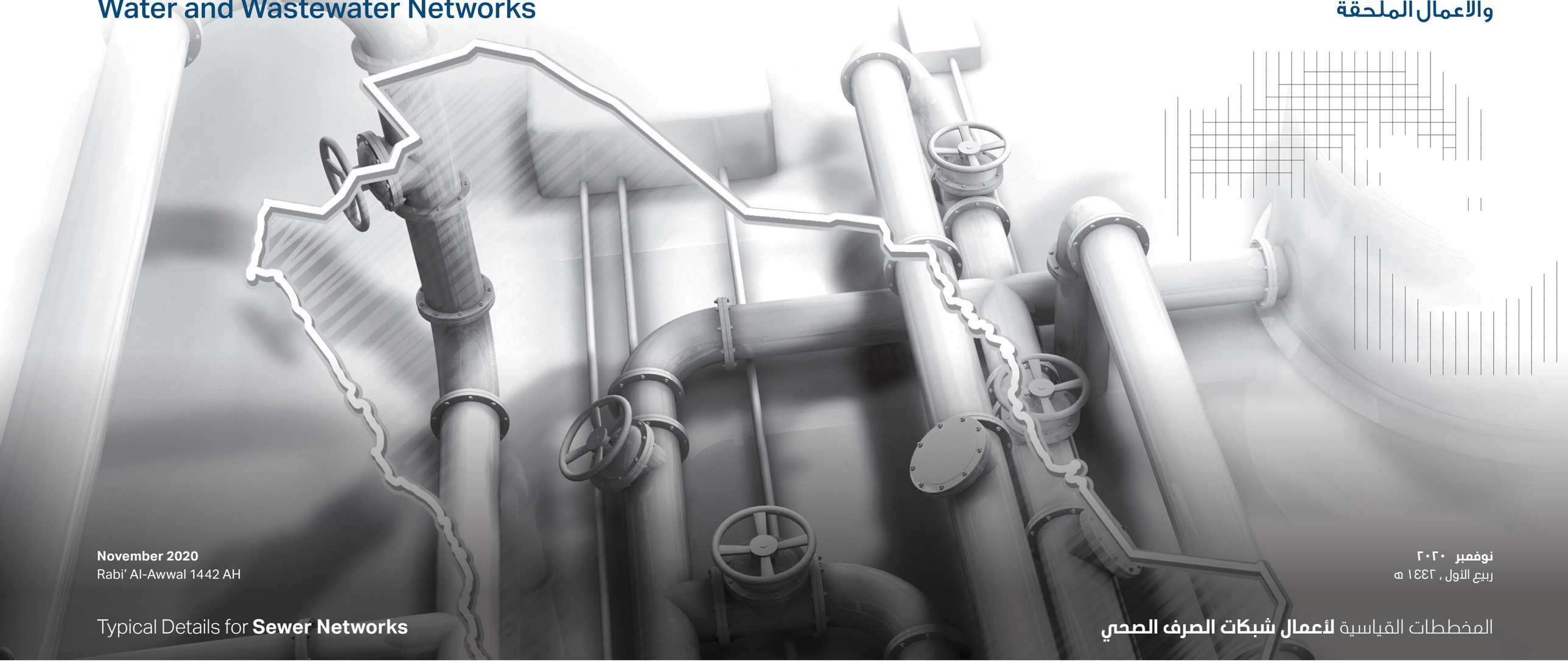

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dar

S19158

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nwc المياه الوطنية

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
LIST OF DRAWINGS

اسم الخريطة :
قائمة اللوحات

Project No: S19158

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SEWAGE NETWORK DETAILS
GENERAL NOTES

1- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

2- ALL DETAILS TO BE READ IN CONJUNCTION WITH SPECIFICATION.

3- THE CONTRACTOR IS RESPONSIBLE TO VERIFY THE GROUND LEVELS. THE TOP OF CHAMBERS SHALL BE FLUSH WITH THE ASPHALT PAVEMENT OR WITH FINISHED SIDEWALK LEVELS IN PAVED STREETS AND IN UNPAVED AREAS AS SHOWN ON PLAN.

4- FOR INTERNAL AND EXTERNAL WALLS PROTECTION REFER TO SPECIFICATION.

5- THE CONTRACTOR SHALL COORDINATE WITH ALL RESPONSIBLE MINISTRIES AND AUTHORITIES REGARDING DATA OR LOCATION OF ALL EXISTING UTILITIES AND REPORT TO THE ENGINEER.

6- ALL EXISTING UTILITY SYSTEMS SHALL BE KEPT IN OPERATION UNTIL THE NEW SYSTEM IS PUT INTO OPERATION, AND IN FULL COORDINATION WITH THE CONCERNED AUTHORITIES.

7- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISCONNECTION AND RECONNECTION OF EXISTING SERVICES TO THE NEW SEWAGE NETWORK.

8- LOCATION AND SLOPE OF EXISTING SEWAGE NETWORK SHALL BE IDENTIFIED ON SITE AND SLOPE OF NETWORK SHALL BE ADOPTED IN COORDINATION WITH THE ENGINEER.

9- FINAL LOCATION OF INSPECTION CHAMBERS SHALL BE SELECTED ON SITE AND SHALL BE APPROVED BY ENGINEER BEFORE CONSTRUCTION.

10- BENCHING SLOPE IN MANHOLES SHOULD NOT EXCEED 10%.

11- USE CIRCULAR FRAME WITH ALL CHAMBER COVERS.

التفاصيل القياسية لشبكات الصرف الصحى
ملاحظات عامة

١ - جميع الأبعاد المذكوره على المخططات بالمم (مليمتر) مالم يذكر خلاف ذلك.

٢ - المخططات و المواصفات الفنية مكملة لبعضها ، و لذلك يجب على المقاول أن يقرأ المخططات بالترابط مع المواصفات الفنية .

٣ - يكون المقاول مسؤولا عن تاكيد مناسيب الارض الطبيعية فى الموقع . ويجب على المقاول تعديل مناسيب أغطية غرف الصمامات لكى تتطابق مع الأسطح النهائية المرصوفة وفى الأماكن الغير مرصوفة يكون ذلك حسب المخططات و حسب توجيهات المهندس .

٤ - يتم الرجوع للمواصفات الفنية بالنسبة لمتطلبات عزل الأسطح الخرسانية الداخلية و الخارجية .

٥ - المرافق والخدمات المبينة على المخططات هى للدلالة فقط ، ويكون المقاول مسؤولا عن التنسيق الكامل مع كافة الجهات المسؤولة عن الخدمات والمرافق الحالية وتحديد مواقعها والحصول على كافة المعلومات المتعلقة بها من الجهات المختصة أو من الموقع مباشرة وابلاغ المهندس عن ذلك .

٦ - يتم المحافظة على كافة الخدمات والمرافق بحالة تشغيلية حتى يتم الإنتهاء من أعمال التنفيذ للمشروع وبالتنسيق الكامل مع كافة الجهات المختصة وحسب توجيهات المهندس .

٧ - يكون المقاول مسؤولا عن أعمال التوصيل والربط لخطوط الصرف الصحى مع خطوط الشبكة الحالية .

٨ - يتم تحديد موقع ومنسوب خطوط الشبكة الحالية التى يتم الربط عليها على الطبيعة ويتم إعتماد الميول اللازمة لخط الشبكة بمعرفة المهندس .

٩ - يتم تحديد المواقع المناسبة لغرف التفتيش على الطبيعة ويجب إعتمادها من المهندس قبل التنفيذ .

١٠- ميول المصطبات فى المناهل يجب الا تتعدى ١٠٪

١١- يتم إستخدام إطارات مستديرة بالنسبة لاغطية الغرف .

nwc المياه الوطنية

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Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
GENERAL NOTES

اسم الخريطة :
ملاحظات عامة

Project No: S19158

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التفاصيل القياسية لشبكات الصرف الصحى
ملاحظات عامة

١٢- يجب ان يكون الحد الأدنى للخلوص الرأسى بين انبوب الماء والمرافق الاخرى ٣٠٠ مم. يجب ان يكون خط الصرف الصحى تحت خط المياه .
فى حالة العبور يتم تغليف خط المياه بالخرسانة.

١٣- يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران غرفة الصمامات / المطبق .
توضع الوصلة الاولى على مسافة لاتزيد عن قطر الانبوب
وتوضع الاخرى على مسافة لاتزيد عن مايلى .
- ضعف قطر الانبوب للاقطار أقل من ٤٥٠ مم .
- ١,٢٠ متر للاقطار من ٤٥٠ مم وحتى ١٠٠٠ مم .
- ١,٨٠ متر للاقطار أكبر من ١٠٠٠ مم .

١٤- يحفر على اغطية المطابق والاغطية نوع المرفق والسلطة المعنية وفئة التصنيف باللغتين الانجليزية والعربية .

١٥- عمق المطبق يعادل عمق الانبوب الخارج

١٦أ- الحماية والتثبيت للأنابيب المكشوفة بالأنفاق: تستخدم الأنابيب المعدنية سواء من الصلب أو DI. ولا يتطلب الصلب ملحوم أى تثبيت إضافى خاص عند الأكواع. يجب تثبيت إضافى خاص عند الأكواع. يجب تثبيت الأنابيب من خلال حواف أو شفاه خاصة PUDDLE فى جدار النفق. يجب أن تكون أنابيب DI فى النفق إما ذات فلنجات أو مقيدة أفقيا ويجب أن يتم تثبيتها عند الأكواع عن طريق قطاعات خاصة عند الشفاه مثبتة فى الجدران الخرسانية.

١٦ ب- الحماية والتثبيت للأنابيب المكشوفة فوق الأرض: يكون الحد من الحفر مطلوبا لاعطاء استواء المنسوب السطحى المطلوب.يجب وضع الانابيب على قاعدة/مصطبة خرسانية مثبتة بشكل مناسب فى الأرض. أبعاد هذه القاعدة/المصطبة مماثلة لتفاصيل الخندق من النوع c. يجب وضع غطاء/ مصطبة أخرى مقلوبة فوق الأنابيب. يجب أن يكون هذا الغطاء كبيرا بما يكفى لمنع الأزالة إلا بالأعمال الماكينكية.

SEWAGE NETWORK DETAILS
GENERAL NOTES

12- THE MINIMUM VERTICAL CLEARANCE BETWEEN WATER PIPE AND SEWER AND ANY OTHER SERVICES SHALL BE 300mm. SEWER SHALL BE BELOW WATER LINE.

IN CASE OF CROSSING, WATER LINE SHALL BE ENCASED IN CONCRETE.

13- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO VALVES CHAMBERS / MANHOLE WALLS. PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
-FOR D < 450mm, X = 2 PIPE DIAMETERS.
-FOR 450 < D < 1000mm, X = 1.20m.
-FOR D > 1000mm, X = 1.80m.

14- COVERS OF MANHOLES AND CHAMBERS SHALL BE INSCRIBED WITH TYPE OF UTILITY, AUTHORITY HAVING JURISDICTION AND GRADE OF COVER IN BOTH ENGLISH AND ARABIC

15- MANHOLE DEPTH IS EQUIVALENT TO DEPTH OF OUTGOING PIPE.

16 A- PROTECTION / ANCHORING FOR EXPOSED PIPES IN TUNNELS: USE METAL PIPE EITHER STEEL OR DI. STEEL ARE WELDED AND DO NOT REQUIRE ANY ADDITIONAL ANCHORING AT ELBOWS/ FITTING. PIPES SHOULD BE ANCHORED THROUGH PUDDLE FLANGES INTO THE TUNNEL WALL. DI PIPES IN TUNNEL SHOULD BE EITHER FLANGED OR HORIZONTALLY RESTRAINED AND THRUST ATELBOWS / FITTINGS SHOULD BE COUNTERED BY ANCHORING THROUGH SPECIAL PUDDLED SECTIONS INTO THE CONCRETE TUNNEL WALLS.

B- PROTECTION / ANCHORING FOR EXPOSED ABOVE GROUND PIPES MINIMUM EXCAVATION REQUIRED TO ENSURE GRADE. PIPE SHOULD BE LAID ON A CONCRETE CRADLE REASONABLY ANCHORED IN GROUND. CRADLE DIMENSION SIMILAR TO TRENCH DETAIL TYPE C. ANOTHER INVERTED CRADLE NEEDS TO BE PLACED ON TOP OF THE PIPES. THIS SHOULD BE LARGE ENOUGH TO PREVENT REMOVAL EXPECT BY MACHINERY.

Design Consultant:

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SEWAGE NETWORK DETAILS
المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
GENERAL NOTES

اسم الخريطة :
ملاحظات عامة

Project No: S19158

Drawing No: 02

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GENERAL

- ALL STRUCTURAL DRAWINGS SHOULD BE READ IN CONJUNCTION WITH UTILITIES AND ALL OTHER RELATED DRAWINGS. REFER SPECIALLY TO ENVIRONMENTAL, DRAWINGS FOR OPENINGS, PIPES & ELECTRICAL CONDUITS BOXES EMBEDDED IN CONCRETE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXACT LOCATION OF ALL DUCT AND PIPE OPENINGS AND SLEEVES IN STRUCTURAL SLABS AND WALLS AND ALL ELECTRICAL CONDUITS AND BOXES EMBEDED IN CONCRETE.
- PROPER COMPACTION SHOULD BE ENSURED UNDERNEATH ALL CONSTRUCTION ON FILL.
- DO NOT SCALE FROM DRAWINGS, ALL DIMENSIONS SHOULD BE READ OR COMPUTED.
- ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHOULD PREPARE AND SUBMIT DRAWINGS INDICATING THE LOCATION OF THE PROPOSED CONSTRUCTION JOINTS IN THE REINFORCED CONCRETE STRUCTURES TO THE ENGINEER'S APPROVAL.
- FOR THE LOCATION & DIMENSIONS OF ALL OPENINGS IN STRUCTURAL ELEMENTS, REFER TO ALL RELEVANT DWGS. ESPICALLY ENVIRONMENTAL DRAWINGS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FIXATION OF ALL FULLY AND PARTIALLY EMBEDDED ACCESSORIES IN CONCRETE SUCH AS ANGLES, PLATES, BOLTS, PIPE FIXATIONS, ETC.... THIS SHOULD BE DONE ACCORDING TO ALL TRADES DOCUMENTS (DRAWINGS, SPECIFICATIONS, ETC...) AND MANUFACTURER RECOMMENDATIONS FOR ANY SELECTED EQUIPEMENT AND ANY PIPE SIZE.
- ALL LEVELS SHOWN ON DRAWINGS ARE TO BE VERIFIED WITH ENVIRONMENTAL DRAWINGS.
- WATER STOP SHOULD BE PROVIDED AT ALL CONSTRUCTION JOINTS OF WATER OR SEWAGE RETAINING STRUCTURES, AND IN THE PRESENCE OF WATER TABLE .
- ANY DISCREPANCY ON THE DRAWINGS OR BETWEEN THE DRAWINGS AND/OR THE SPECIFICATION AND/OR THE SPECIFIED STANDARDS SHALL BE REFERRED TO THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- SHOP DRAWINGS AND BAR BENDING SCHEDULES SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED AS DEFINED IN THE CONTRACT. WORK SHALL NOT COMMENCE UNTIL REVIEWED AND ACCEPTED. REVIEW OF THESE DRAWINGS DOES NOT ALLEVIATE THE CONTRACTOR'S RESPONSIBILITIES.

CONCRETE AND REINFORCED CONCRETE

- BASIS OF DESIGN : a-THE ACI 318M-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL REINFORCED CONCRETE.
  b- SBC 301 FOR STRUCTURAL REINFORCED CONCRETE.
  c- ACI 350-06 AND ACI 224R-01 FOR WATER RETAINING STRUCTURES.
- PARTICULAR CARE SHOULD BE GIVEN TO THE PLACING OF REINFORCEMENT, THE MAKING OF CONCRETE, AND TO FOLLOW THE SPECIFICATIONS CAREFULLY.
- CONCRETE:
  a - ALL REINFORCED CONCRETE SHOULD HAVE A MINIMUM CRUSHING STRENGTH ON CYLINDER AT 28 DAYS: f'c = 350 kg/cm UNLESS OTHERWISE NOTED.
  b - ALL PLAIN CONCRETE SHOULD HAVE A MINIMUM CRUSHING STRENGTH ON CYLINDER AT 28 DAYS: f'c = 110kg/cm.
  c - ALL CONCRETE SHALL BE PREMIXED BY A REVIEWED AND ACCEPTED SUPPLIER.
  d - CONCRETE MIX TYPE SHALL BE AS SPECIFIED.
  e - CEMENT TYPE SHALL TO COMPLY WITH THE SPECIFICATIONS AND SOIL RECOMMENDATION BASED ON THE SOIL INVESTIGATION REPORT.
- ALL CONCRETE SHALL BE COMPACTED USING A MECHANICAL VIBRATION PROCESS.
- CONCRETE SHALL BE CURED IN ACCORDANCE WITH THE SPECIFICATION.
- REINFORCEMENT:
  a - ALL REINFORCEMENT (TOR STEEL DENOTED) TO BE OF HIGH TENSILE STEEL HAVING A MINIMUM YIELD STRESS fy= 4200 kg/cm.
  b - LAP LENGTH OF ALL REINFORCING BARS SHALL BE AS SHOWN ON THE DRAWINGS, BUT NOT LESS THAN 50 BAR DIAMETER.
  c - WHEN REINFORCEMENT IS SHOWN ON PLAN:
  - FULL LINES DENOTE BOTTOM REINFORCEMENT.
  - DASHED LINES DENOTE TOP REINFORCEMENT.
- THE CONCRETE PROTECTIVE COVER FOR ANY REINFORCEMENT SHALL BE AS FOLLOWS, UNLESS OTHERWISE SHOWN ON THE DRAWINGS:
  FOR WALLS NOT EXPOSED TO EARTH OR WATER : 30mm.
  FOR BEAMS : 40mm.
  FOR WALLS EXPOSED TO EARTH OR WATER : 50mm.
  FOR FOUNDATIONS IN DIRECT CONTACT WITH SOIL AND WATER : 75mm.
  FOR ALL SURFACES IN CONTACT WITH SEWAGE : 75mm.
- ALL CONCRETE REINFORCEMENT SHALL BE DETAILED, FABRICATED, LABELED, SUPPORTED AND SPACED IN FORMS AND SECURED IN PLACE IN ACCORDANCE WITH THE PROCEDURES AND REQUIREMENTS OF THE PROJECT SPECIFICATIONS.
- ALL BENDING OF REINFORCEMENT SHALL BE DONE BY COLD BENDING.
- WELDING AND/OR SITE CUTTING OF REINFORCING SHALL NOT BE PERMITTED UNLESS REVIEWED AND ACCEPTED IN WRITING BY THE ENGINEER.

WATERPROOFING

- APPLY TWO LAYERS OF BITUMINOUS COATING FOR ALL REINFORCED CONCRETE SURFACE IN CONTACT WITH SOIL.
- APPLY COAL-TAR EPOXY AS PER SPECIFICATIONS TO ALL SURFACES CONTACT WITH SEWAGE.

FOUNDATION NOTES

- DESIGN IS BASED ON DRY CONDITION. IF WATER TABLE IS ENCOUNTERED DURING EXCAVATION OR EXECUTION CONTRACTOR SHALL INFORM ENGINEER & REDESIGN OF THE STRUCTURE SHALL BE CONSIDERED.
- ALL SUBSURFACE STRUCTURES SHOULD BE PROTECTED BY ISOLATING THE STRUCTURE WITH APPROPRIATE PROTECTIVE COATING OR SHEETING.

WORKMANSHIP AND CONSTRUCTIONAL REQUIREMENTS

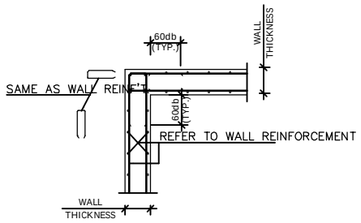
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE AND ANY ADJACENT STRUCTURES IN A SAFE AND STABLE CONDITION AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR IS TO DEVELOP A DETAILED, SAFE WORK METHOD STATEMENT OUTLINING THE CONSTRUCTION SEQUENCE AND METHODOLOGY. THE CONTRACTOR IS TO ENGAGE A QUALIFIED AND SUITABLY EXPERIENCED ERECTION ENGINEER TO REVIEW THE CONSTRUCTION METHODOLOGY AND PROVIDE DESIGN OF TEMPORARY WORKS (SUCH AS PROPPING AND TEMPORARY BRACING) TO SUIT THE CONSTRUCTION SEQUENCE AND METHODOLOGY CHOSEN BY THE BUILDER.
- ALL FORMS, FALSEWORK ERECTION PROCEDURES ETC. SHALL BE APPROVED BY THE COMPANY BEFORE THEY CAN BE USED ON SITE.

PRECAST ELEMENTS

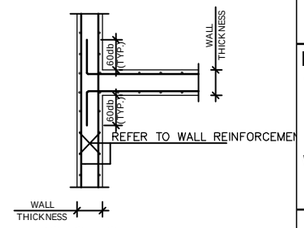
- ALL PRECAST ELEMENTS TO BE POURED ON SITE AND FOLLOWING THE SPECIFICATIONS

FORMWORK

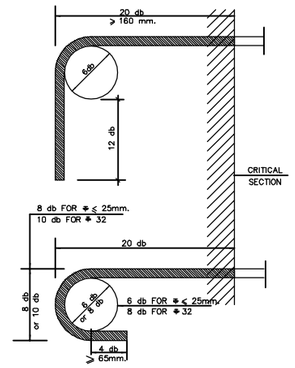
- PRIOR TO PLACEMENT OF CONCRETE, THE CONTRACTOR SHALL HAVE THE FORMWORK INSPECTED BY THE FORMWORK DESIGN ENGINEER.
- WHERE NOT EXPOSED IN THE FINAL STRUCTURE, FORMWORK SHALL BE CONSTRUCTED TO PREVENT BLEEDING DURING POURING OF CONCRETE AND TO TOLERANCES COMPATIBLE WITH APPLIED FINISHES & DETAILS.
- THE SEQUENCE OF CONCRETE PLACEMENT FOR THE WORKS IS TO BE SPECIFIED BY THE CONTRACTOR AND SUBMITTED FOR THE ENGINEER APPROVAL UNLESS NOTED OTHERWISE IN THE DRAWINGS.



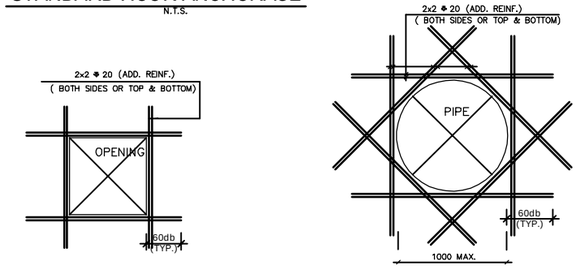
TYPICAL CORNER WALL HORIZONTAL REINFORCEMENT DETAILS
N.T.S.



TYPICAL INTERSECTION WALL HORIZONTAL REINFORCEMENT DETAILS
N.T.S.



STANDARD HOOK ANCHORAGE
N.T.S.



TYPICAL REINFORCEMENT DETAIL AROUND OPENINGS IN WALLS AND SLAB
(UNLESS OTHERWISE SHOWN ON DRAWINGS)
N.T.S.

TABLE OF DEVELOPMENT AND SPLICE LENGHTS OF BARS

BAR DIAMETER	DEVELOPMENT LENGTH (ld)	SPLICE LENGTH (ls)
10 Φ	30db	50db
12 Φ	30db	50db
14 Φ	30db	50db
16 Φ	30db	50db
20 Φ	40db	50db
25 Φ	45db	60db*
32 Φ	50db	60db*

* WHEN TWO DIFFERENT BAR DIAMETERS ARE SPLICED, THE SPLICE LENGTH SHALL BE BASED ON THE LOWER BAR DIAMETER.

LEGEND

Φ	HIGH TENSILE STEEL
Φ	LEVEL IN PLAN
	LEVEL IN SECTION
	OPENING
150mm.	150mm INDICATES THICKNESS OF SLAB
R.C.	REINFORCED CONCRETE
N.T.S	NOT TO SCALE
TYP.	TYPICAL

nwc المياه الوطنية

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسـم المشـروع:
المواصـفات الفنيـة وجـداول الكميـات القياسـية والمخططـات لشـبكات الميـاه والصـرف الصـحي والأعمـال الملحقـة

Notes:

SEWAGE NETWORK DETAILS

المخططـات القياسـية لشـبكات الصـرف الصـحي

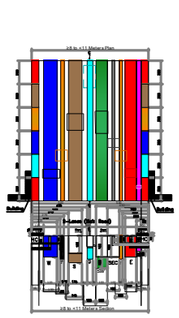
Drawing Name:
STRUCTURAL
GENERAL NOTES

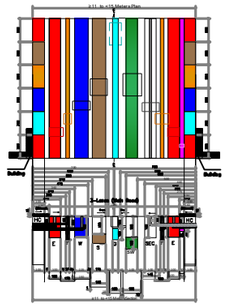
اسـم الخريطـة :
الملاحظـات الانشـائية العامـة

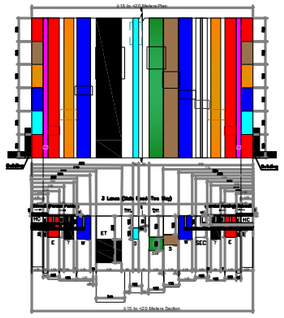
Project No: S19158

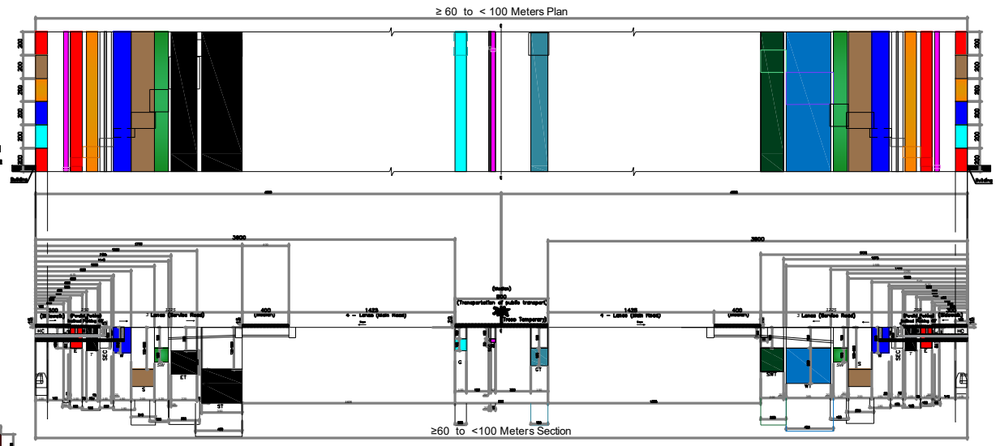
Drawing No: 03

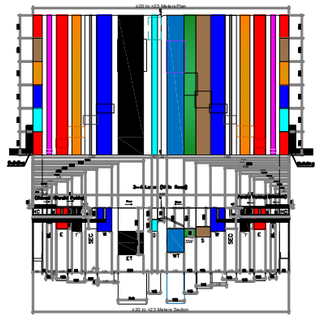
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

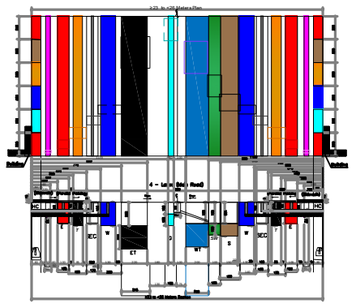


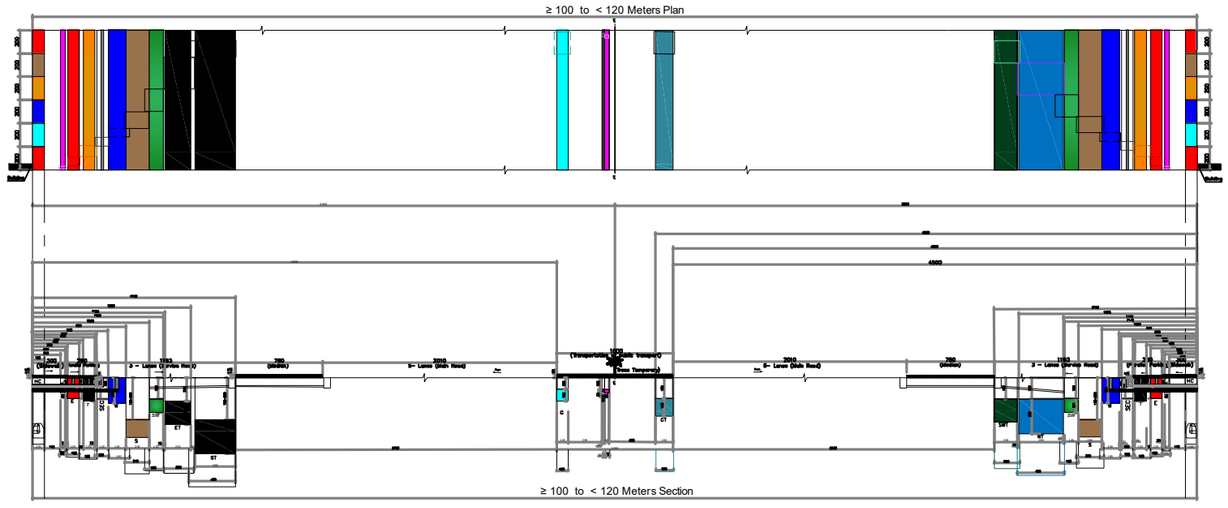


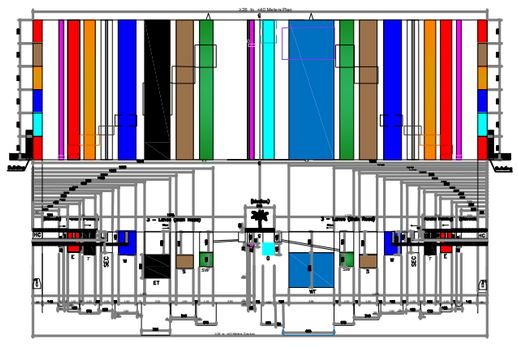


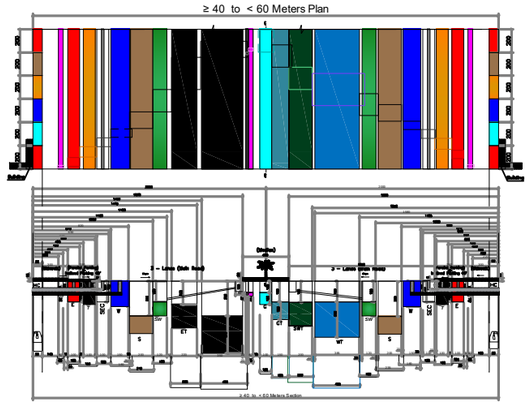


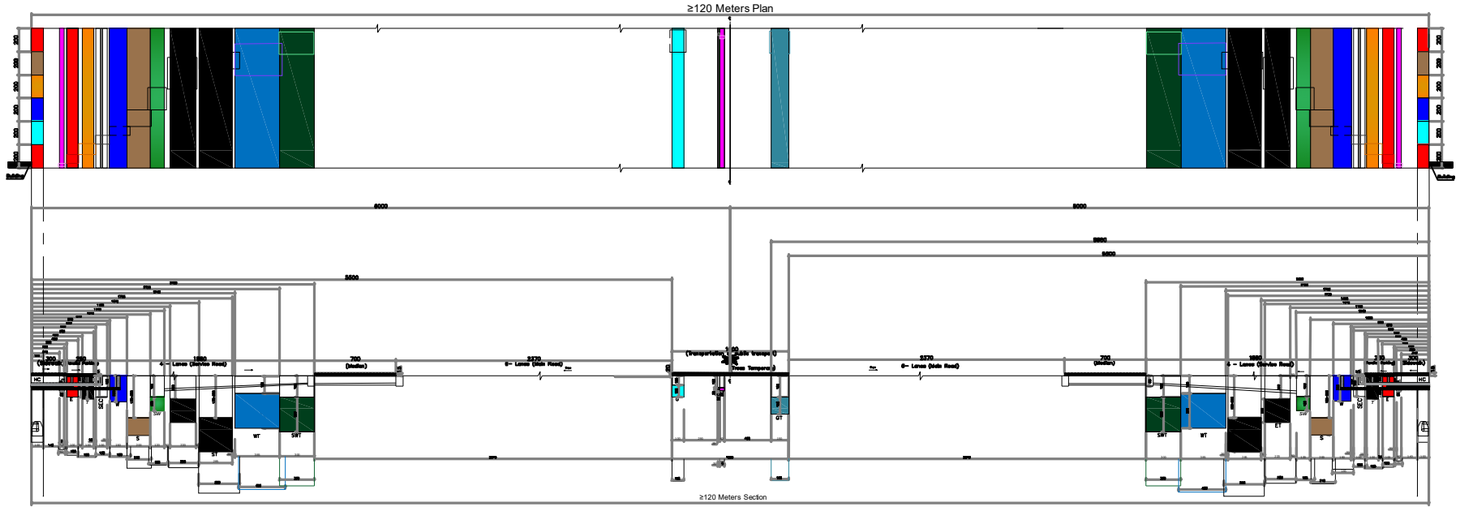












LEGEND

Home Connections	HC	
Street Lighting & Traffic Lights	SL	
Sanitary	S	
Storm Water	SW	
Electricity (LV or MV)	E	
Telephone Main and Secondary With Mini And Micro Trench	T	
Water	W	
GAS	G	
Security Cable	SEC	
Electricity Transfer (HV or EHV)	ET	
Security Camera Cable	SEC	
Available Utility Corridor	AUC	
Water Transfer	WT	
GAS Transfer	GT	
Storm Water Transfer	SWT	
Sanitary Transfer	ST	

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- UNLESS OTHERWISE INDICATED ALL DIMENSIONS ARE IN CENTIMETRES .
2- THE NORTH OR EAST SIDE OF THE ROAD SHALL BE TAKEN AS THE RIGHT SIDE .

١-جميع الابعاد بالسنتيمتر الا اذا ذكر خلاف ذلك
٢-سوف يشار الى الجهتين الشمالية والجنوبية من الطريق على انهما الجانب الايمن

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

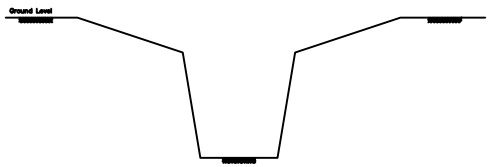
Drawing Name:
UTILITIES DISPOSITION ALONG ROADS

اسم الخريطة :
تنسيق مواقع الخدمات

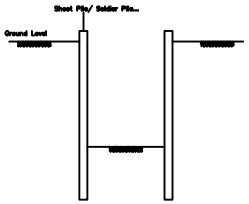
Project No: S19158

Drawing No: 04

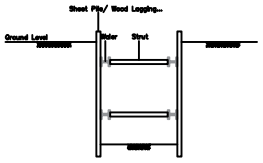
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020



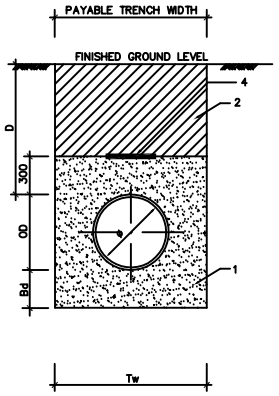
Open Excavation
in hard soil/ rock
no adjacent constraints
shallow depths
cut slopes based on
ground conditions



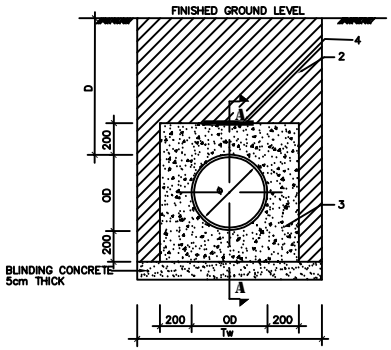
Cantilever Support
depends on ground conditions
available support system
adjacent surcharge/constraints



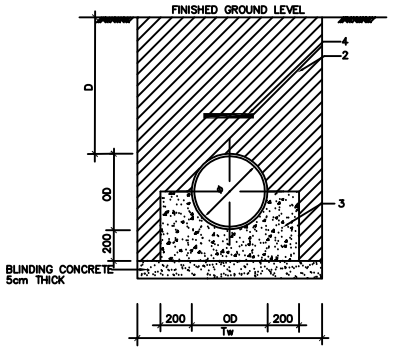
Braced Excavation
in case of deep trenches
adjacent surcharge/constraints
hydrostatic pressure
poor soil



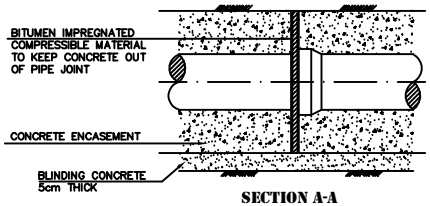
TYPE "A"
5000 ≥ DEPTH OF COVER ≥1000mm.



TYPE "B"
DEPTH OF COVER < 1000mm.



TYPE "C"



SECTION A-A

FLEXIBLE JOINT FOR CONCRETE SURROUND

تفاصيل حفر الخنادق

PIPE TRENCH DETAIL

TYPE OF BEDDING / FILLING MATERIAL	
1	GRANULAR MATERIAL WELL COMPACTED UNDER AND AROUND THE PIPE. OR CRUSHED AGGREGATE (REFER TO SPECIFICATION FOR GRADATION)
2	MATERIAL SELECTED FROM TRENCH EXCAVATION WELL COMPACTED TO 95 % OF MAXIMUM DRY DENSITY
3	MASS CONCRETE CLASS 110/25
4	DETECTABLE WARNING TAPE

PAYABLE TRENCH WIDTH

PIPE DIAMETER (mm.)	TRENCH WIDTH (mm.)	PAVEMENT REINSTATEMENT (mm.)
100	650	950
110	650	950
200	700	1000
250	750	1050
300	850	1150
350	900	1200
400	950	1250
450	1050	1350
500	1100	1400
600	1250	1550
700	1350	1650
800	1500	1800
900	1600	1900
1000	1750	2050
1100	1900	2200
1200	2000	2300
1400	2250	2550
1500	2400	2700
1600	2550	2850
1800	2800	3100
2000	3050	3350
2200	3300	3600

NOTES:

1- OD = EXTERNAL DIAMETER OF PIPE.

2- D = DEPTH OF COVER (m.) REFER TO PROFILES.

3- DEPTH OF BEDDING = Bd
Bd = 150mm. IN SOIL
Bd = 200mm. IN ROCK

4- WSR WIDTH OF SURFACE REINSTATEMENT
WSR=TW+2.50m
USE FOR EXISTING ROADS ONLY

5- USE TYPE "A" BEDDING FOR ALL NETWORKS EXCEPT FOR THE FOLLOWING CASES USE BEDDING TYPE "B".
a- DEPTH OF COVER IS LESS THAN 1.00m.
b- UNDER STREET LIGHTING POLES.
c- AT SEWER LINE / WATER LINE CROSSING. WHERE THE VERTICAL DISTANCE IS LESS THAN 0.5m, THE SEWER PIPE SHALL BE ENCASED FOR A DISTANCE OF AT LEAST 4.0m FROM EACH SIDE OF THE WATER PIPE.

6- USE BEDDING TYPE "C" ACCORDING TO COVER DEPTH PROVIDE LOAD CALCULATION TO SUPPORT SELECTION

7- WHEN POURING CONCRETE THE PIPE MUST BE RESTRAINED AGAINST MOVEMENT BY STRAPPING IT TO A BASE SLAB, OR ANCHOR.

8- FOR DEPTHS BIGGER THAN 5 METERS, BEDDING SHALL BE AS PER MANUFACTURER RECOMMENDATIONS.

nwc المياه الوطنية

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1-WHEREVER THE SEWAGE PIPES ARE CROSSING UNDER A ROAD PAVEMENT STRUCTURE, IT IS RECOMMENDED THAT A MINIMUM CLEARANCE OF 1.2m BETWEEN THE TOP OF CONCRETE ENCASEMENT OF THE PIPE AND THE ROAD'S F.G.L. IS MAINTAINED. FOR THE CASE WHERE THIS MINIMUM CLEARANCE CANNOT BE RESPECTED, AN APPROACH SLAB OR A TAPERED CYCLOPEAN CONCRETE APPROACHES SHALL BE ADDED FROM BOTH SIDES OF THE CONCRETE ENCASEMENT IN ORDER TO PROVIDE GRADUAL TRANSITION IN RIGIDITY AND AVOID DIFFERENTIAL SETTLEMENT OF THE SUBGRADE UNDER THE PAVEMENT STRUCTURE.

2-PAVEMENT REINSTATEMENT AS PER MOMRA AND MOT SPECIFICATION.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

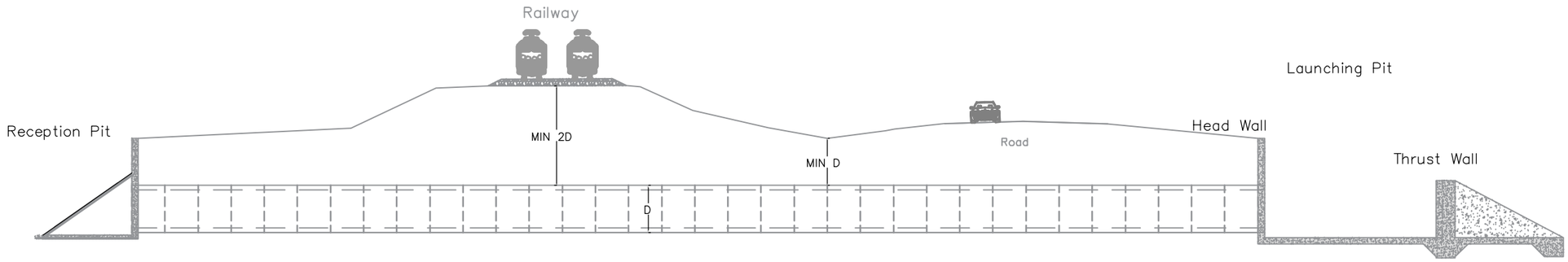
Drawing Name:
TRENCH, EXCAVATION AND SUPPORT DETAILS

اسم الخريطة :
تفاصيل الخنادق و الحفر و التدعيم

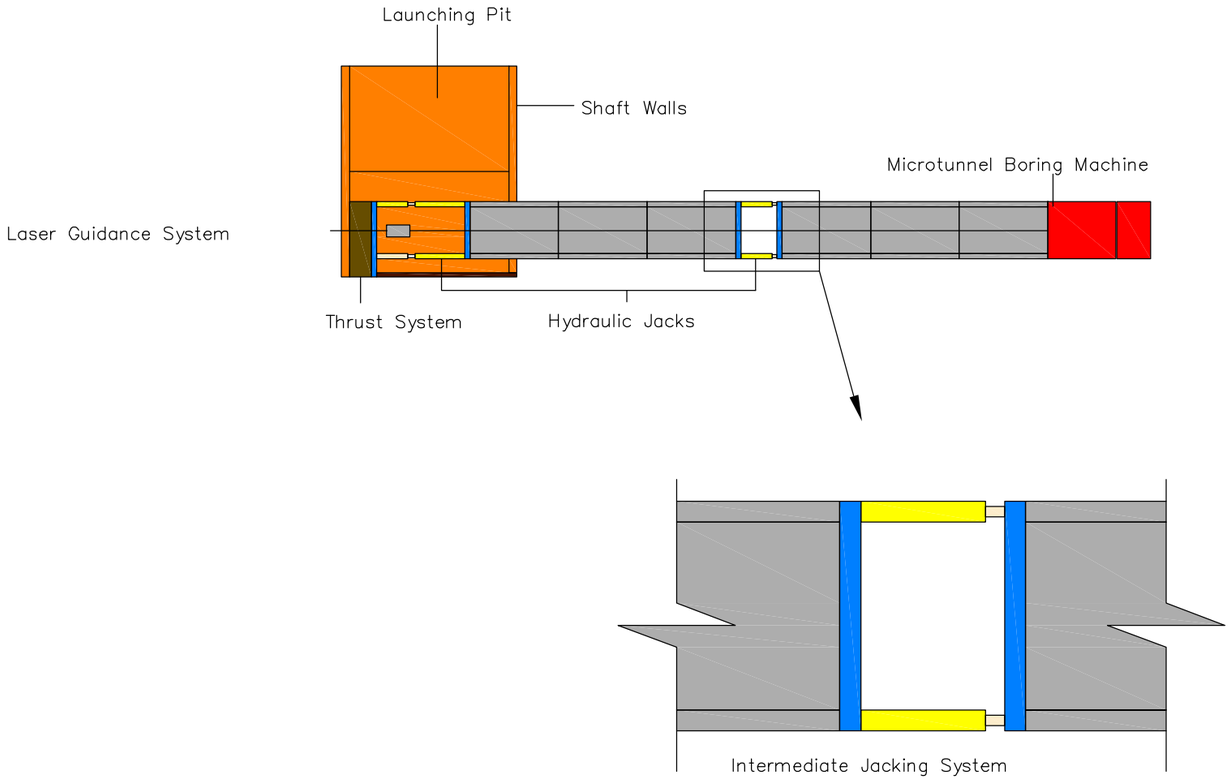
Project No: S19158

Drawing No: 05

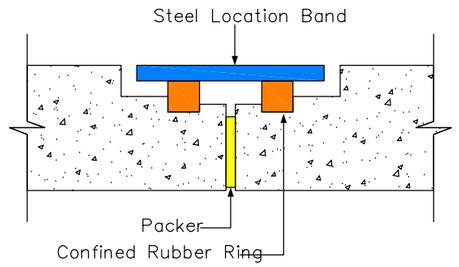
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

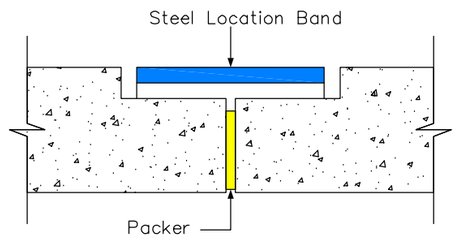


Typical Pipe Jacking Profile under Railway and Roads



Typical Jacking Arrangement





Typical Joint Detail

Notes:

1–WHEREVER THE SEWAGE PIPES ARE CROSSING UNDER A ROAD PAVEMENT STRUCTURE, IT IS RECOMMENDED THAT A MINIMUM CLEARANCE OF 1.2m BETWEEN THE TOP OF CONCRETE ENCASEMENT OF THE PIPE AND THE ROAD'S F.G.L. IS MAINTAINED. FOR THE CASE WHERE THIS MINIMUM CLEARANCE CANNOT BE RESPECTED, AN APPROACH SLAB OR A TAPERED CYCLOPEAN CONCRETE APPROACHES SHALL BE ADDED FROM BOTH SIDES OF THE CONCRETE ENCASEMENT IN ORDER TO PROVIDE GRADUAL TRANSITION IN RIGIDITY AND AVOID DIFFERENTIAL SETTLEMENT OF THE SUBGRADE UNDER THE PAVEMENT STRUCTURE.

2–PAVEMENT REINSTATEMENT AS PER MOMRA AND MOT SPECIFICATION.

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

MICRO TUNNELING / PIPEJACKING TYPICAL DETAILS

اسم الخريطة :

دفع الأنابيب و الحفر النفقي

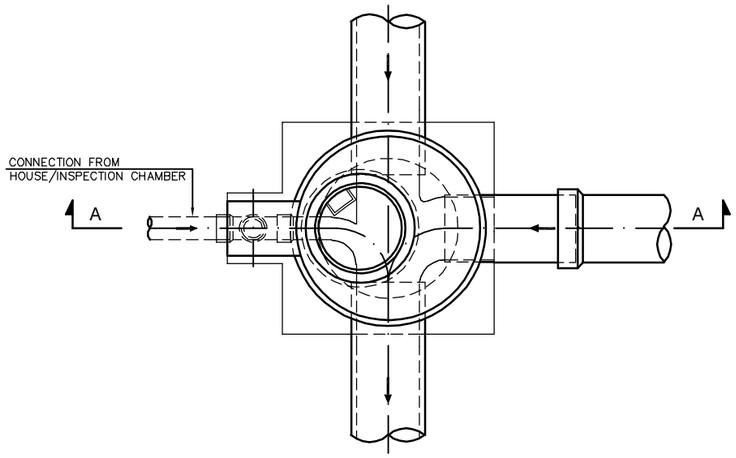
Project No: S19158

Drawing No: 05A

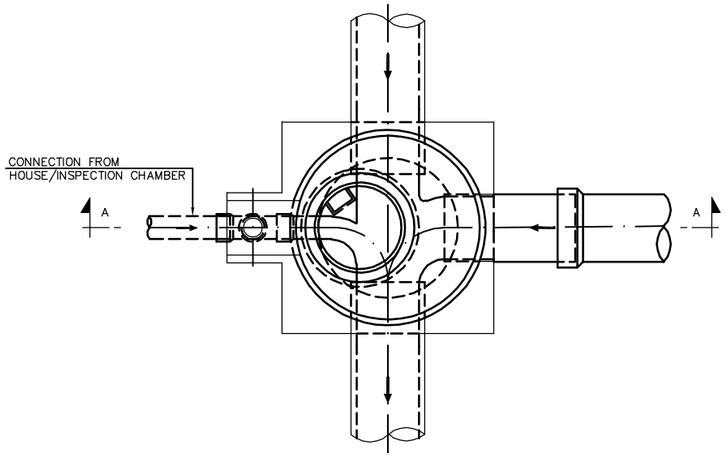
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

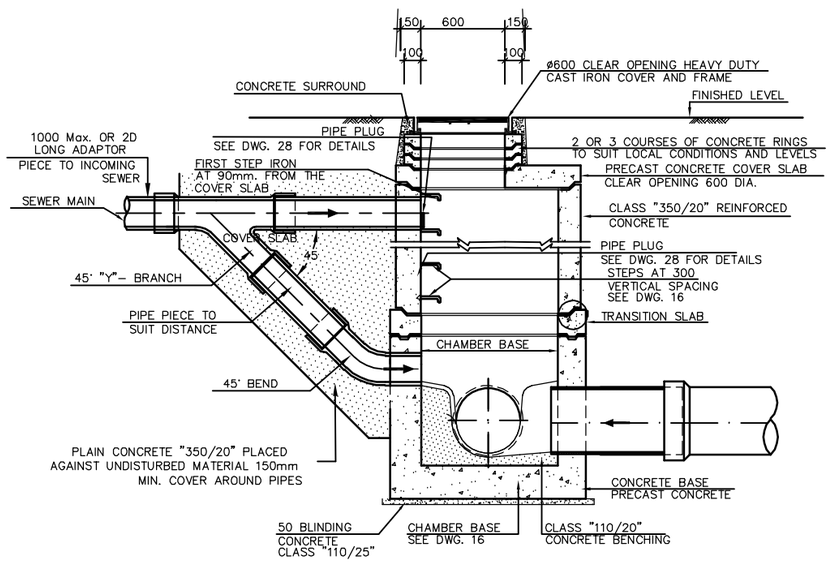
MANHOLE CHAMBER RINGS		
DIA. OF LARGEST PIPE	CHAMBER RING DIA.	CHAMBER BASE
200 – 600 mm.	1200 mm.	ø 1200 mm.
700 – 900 mm.	2000 mm.	ø 2000 mm.
1000 – 1500 mm.	2500 mm.	ø 2500 mm.



PLAN



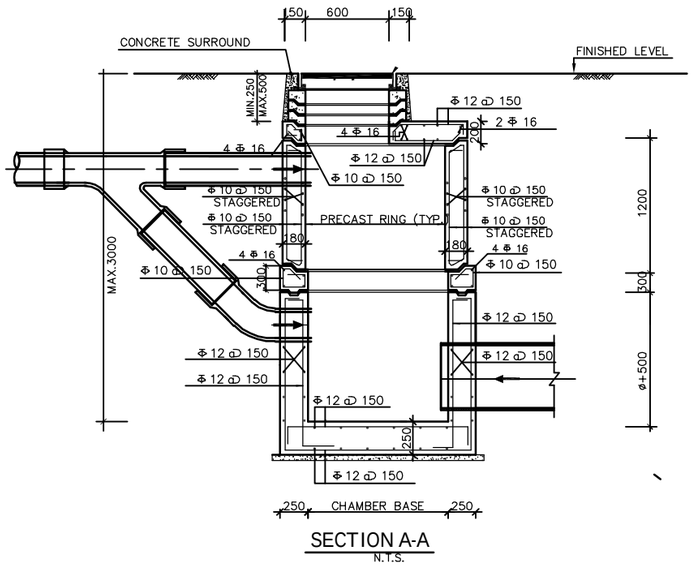
PLAN
N.T.S.



SECTION A-A

تفاصيل المناهل مسبقة الصب بعمق اقل من ٣٠٠٠مم

DETAILS OF PRECAST MANHOLES DEPTH < 3000MM



SECTION A-A
N.T.S.

تفاصيل تسليح المناهل مسبقة الصب بعمق اقل من ٣٠٠٠مم

REINFORCEMENT DETAILS FOR PRECAST MANHOLES DEPTH < 3000MM

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

PRECAST MANHOLE DETAILS FOR DEPTH < 3000

اسم الخريطة :

تفاصيل المناهل مسبقة الصب بعمق أقل من ٣٠٠٠ مم

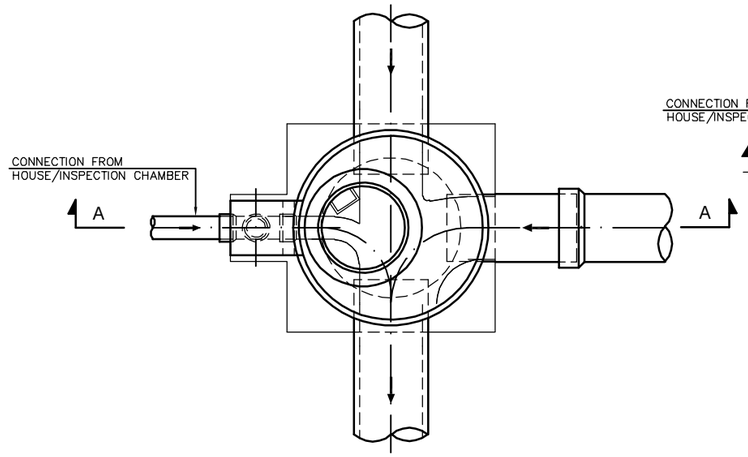
Project No: S19158

Drawing No: 06

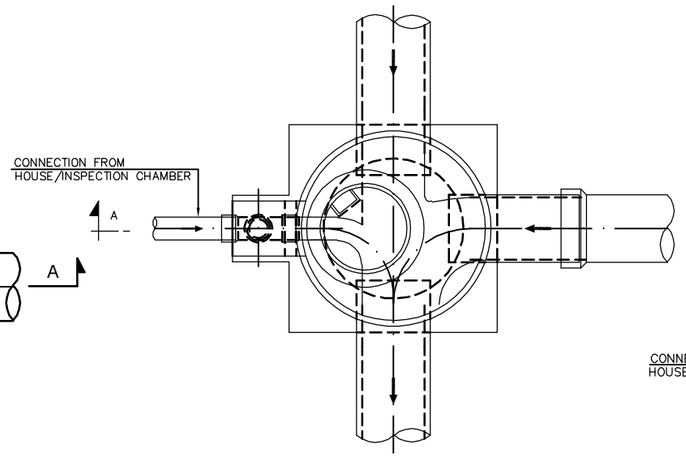
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

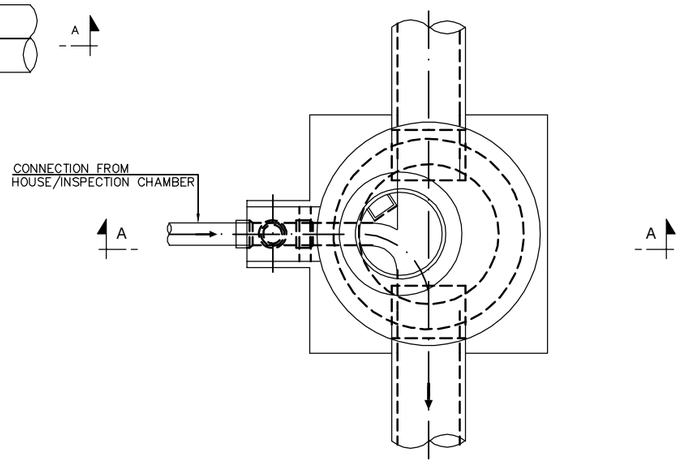
MANHOLE CHAMBER RINGS		
DIA. OF LARGEST PIPE	CHAMBER RING DIA.	CHAMBER BASE
300 – 600 mm.	1200 mm.	ø 1200 mm.
700 – 900 mm.	2000 mm.	ø 2000 mm.
1000 – 1500 mm.	2500 mm.	ø 2500 mm.
1500 – 2000 mm.	4000 mm.	ø 4000 mm.



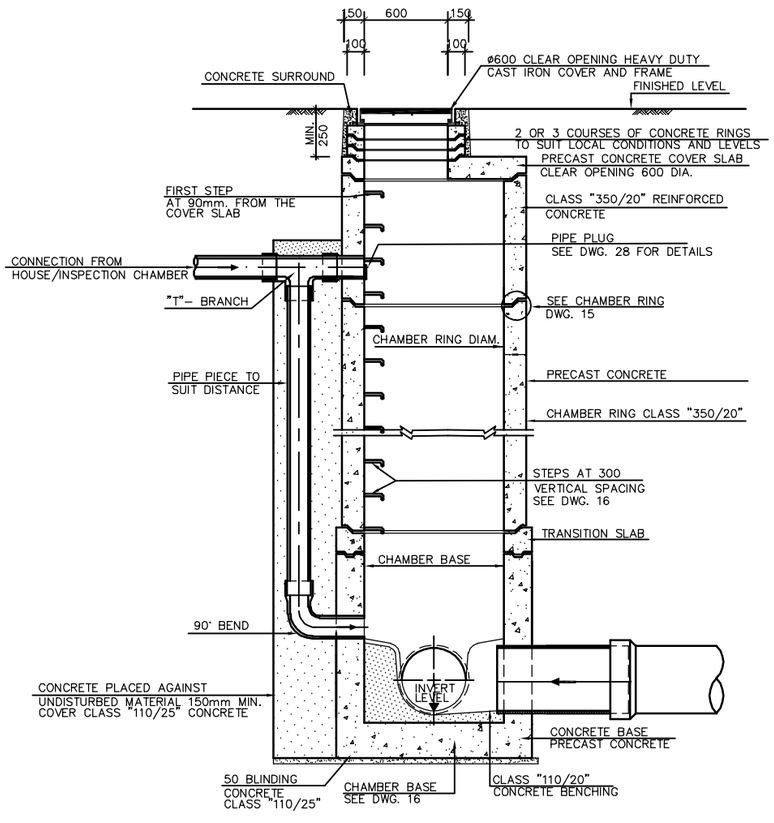
PLAN



PLAN
N.T.S.



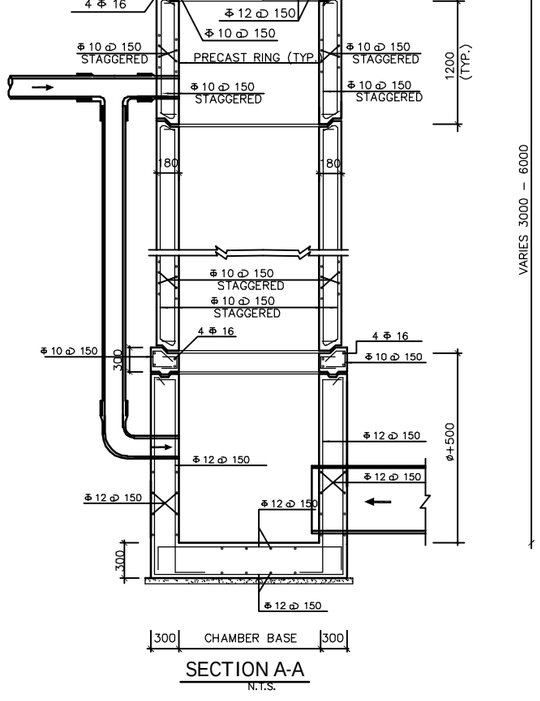
PLAN
N.T.S.



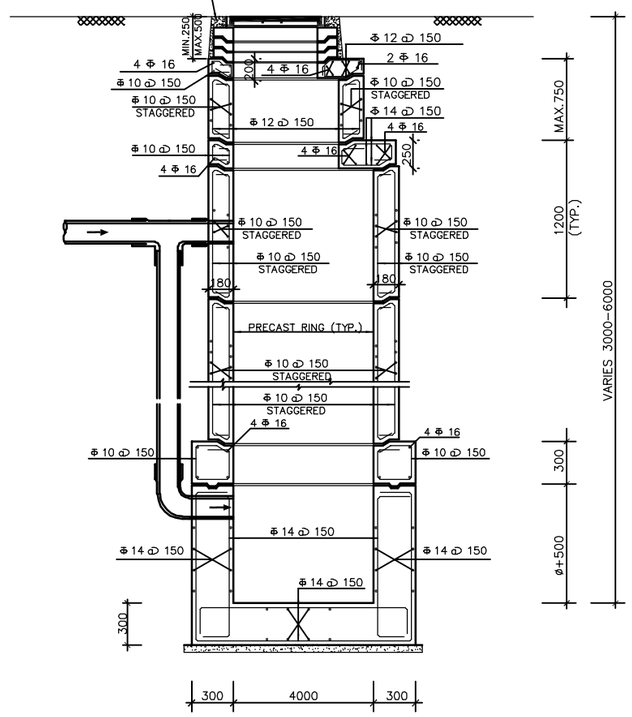
SECTION A-A

تفاصيل المناهل مسبقة الصب بعمق من ٣٠٠٠- ٦٠٠٠ مم

DETAILS OF PRECAST MANHOLES FOR DEPTH FROM 3000 TO 6000MM



SECTION A-A
N.T.S.



SECTION A–A
N.T.S.

تفاصيل تسليح المناهل مسبقة الصب بعمق من ٣٠٠٠- ٦٠٠٠ مم

REINFORCEMENT DETAILS OF PRECAST MANHOLES FOR DEPTH FROM 3000 TO 6000MM

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

PRECAST MANHOLE DETAILS
FOR DEPTH 3000 - 6000 mm

اسم الخريطة :

تفاصيل المناهل مسبقة الصب
بعمق من ٣٠٠٠-٦٠٠٠مم

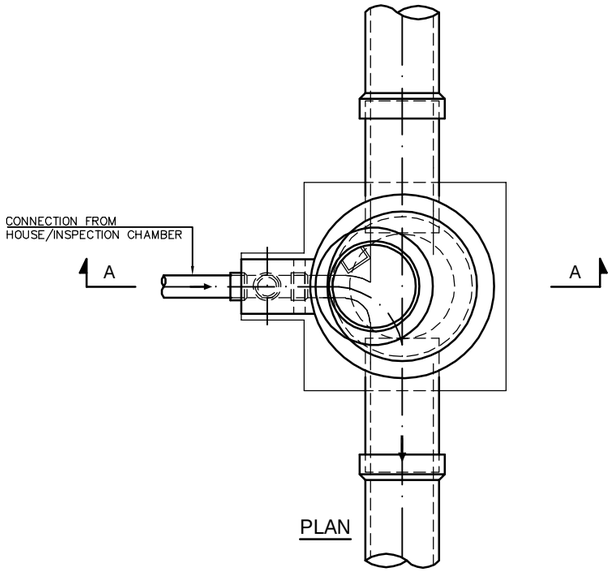
Project No: S19158

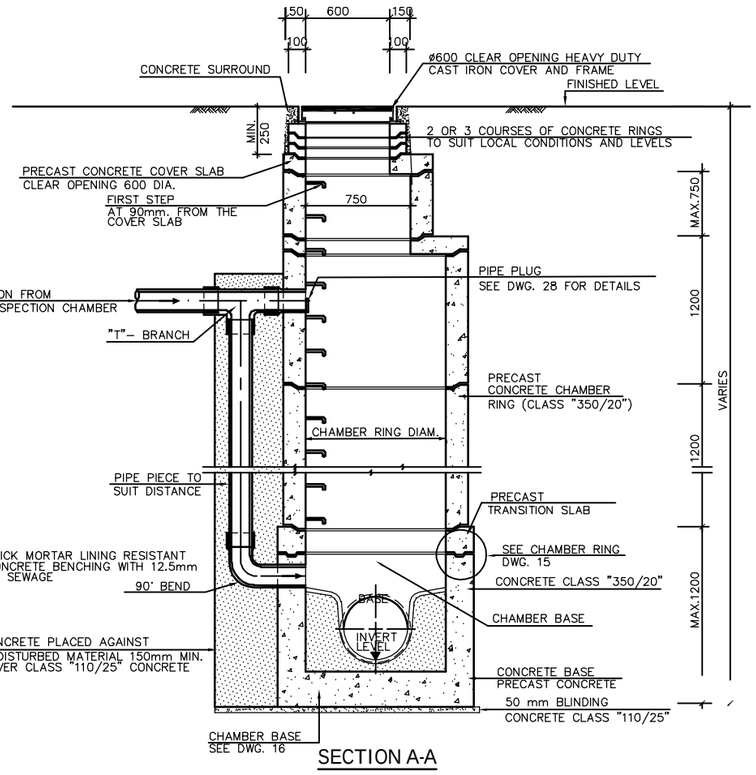
Drawing No: 07

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

MANHOLE CHAMBER RINGS		
DIA. OF LARGEST PIPE	CHAMBER RING DIA.	CHAMBER BASE
300 – 600 mm.	1200 mm.	ø 1200 mm.
700 – 900 mm.	2000 mm.	ø 2000 mm.
1000 – 1200 mm.	2500 mm.	ø 2500 mm.
1300 – 1500 mm.	2500 mm.	ø 2500 mm.

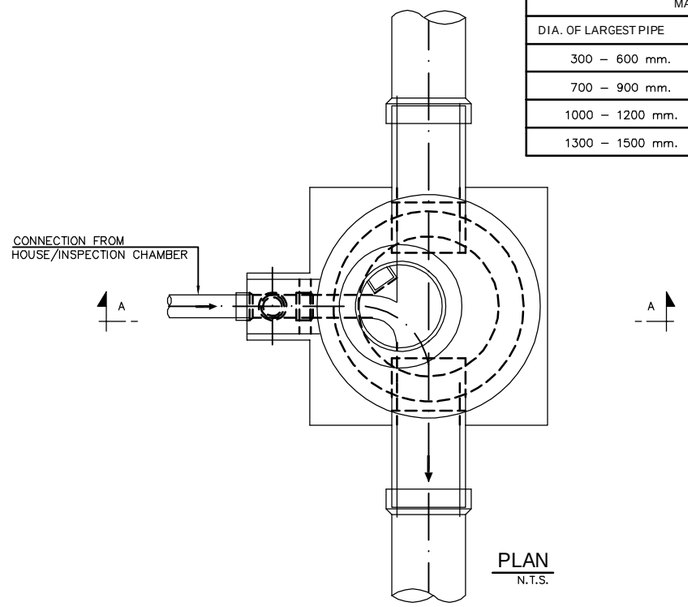


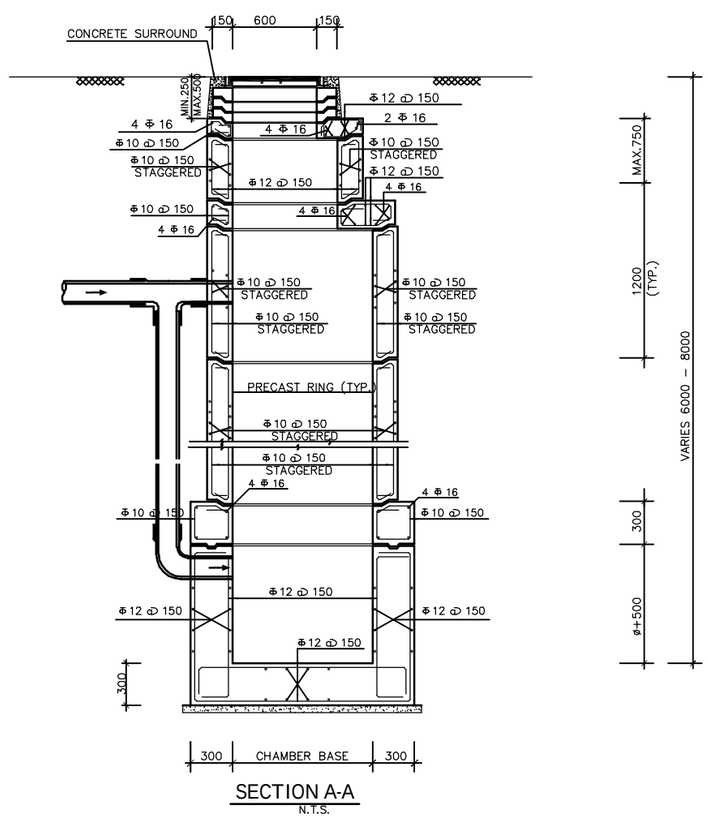


SECTION A-A

تفاصـــيل تســـليح المناهـــل مســـبقة الصـــب بعمـــق ٦٠٠٠ – ٨٠٠٠ مم

DETAILS OF PRECAST MANHOLES FOR DEPTH FROM 6000 - 8000MM





SECTION A-A
N.T.S.

تفاصـــيل تســـليح المناهـــل مســـبقة الصـــب بعمـــق ٦٠٠٠ – ٨٠٠٠ مم

REINFORCEMENT DETAILS OF PRECAST MANHOLES FOR DEPTH FROM 6000 - 8000MM

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسـم المشـروع:
المواصـفات الفنيـة وجـداول الكميـات القياسـية والمخططـات لشـبكات الميـاه والصـرف الصـحي والأعمـال الملحقـة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططـات القياسـية لشـبكات الصـرف الصـحي

Drawing Name:

PRECAST MANHOLE DETAILS FOR DEPTH 6000 - 8000 mm

اسـم الخريطـة :

تفاصـيل المناهـل مسـبقة الصـب بعمق من ٦٠٠٠–٨٠٠٠مم

Project No: S19158

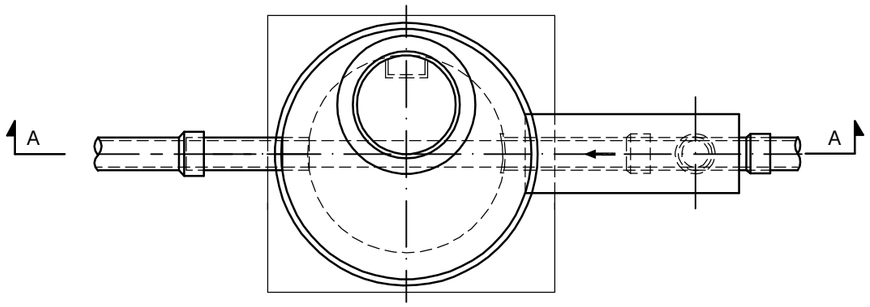
Drawing No: 08

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

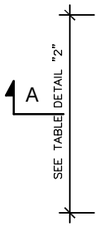
MANHOLE CHAMBER RINGS		
DIA. OF LARGEST PIPE	CHAMBER RING DIA.	CHAMBER BASE
200 – 600 mm.	1200 mm.	ø 1200 mm.
700 – 900 mm.	2000 mm.	ø 2000 mm.
1000 – 1500 mm.	2500 mm.	ø 2500 mm.
1500 – 2000 mm.	4000 mm.	ø 4000 mm.

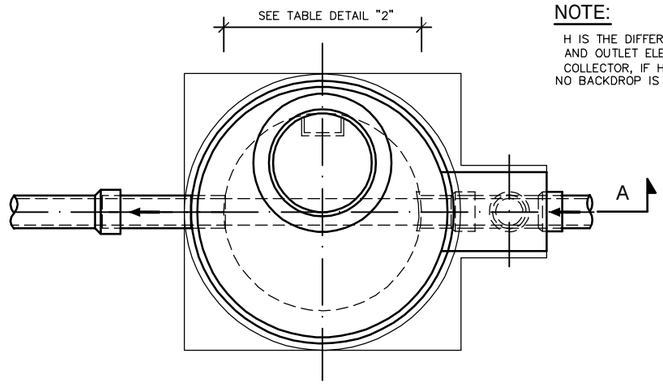
NOTE:

H IS THE DIFFERENCE BETWEEN INLET AND OUTLET ELEVATION OF SEWER COLLECTOR, IF H IS LESS THAN 60CM. NO BACKDROP IS REQUIRED.

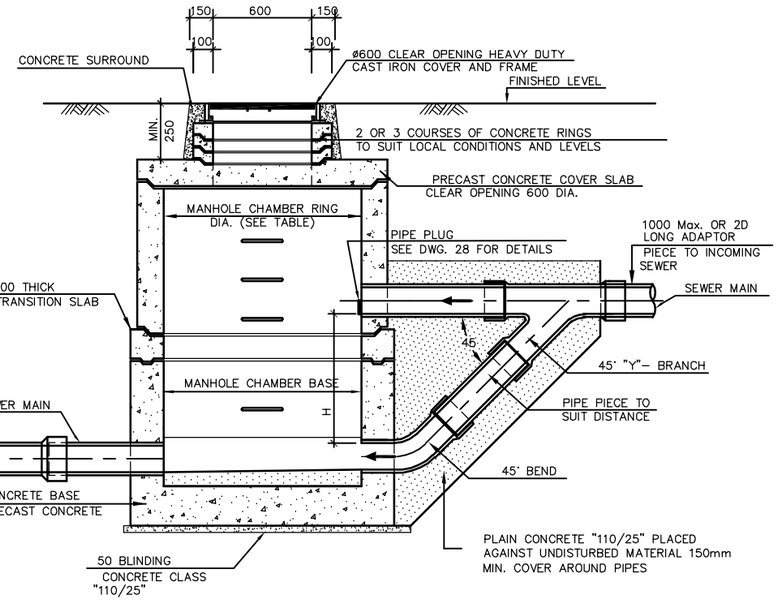


PLAN

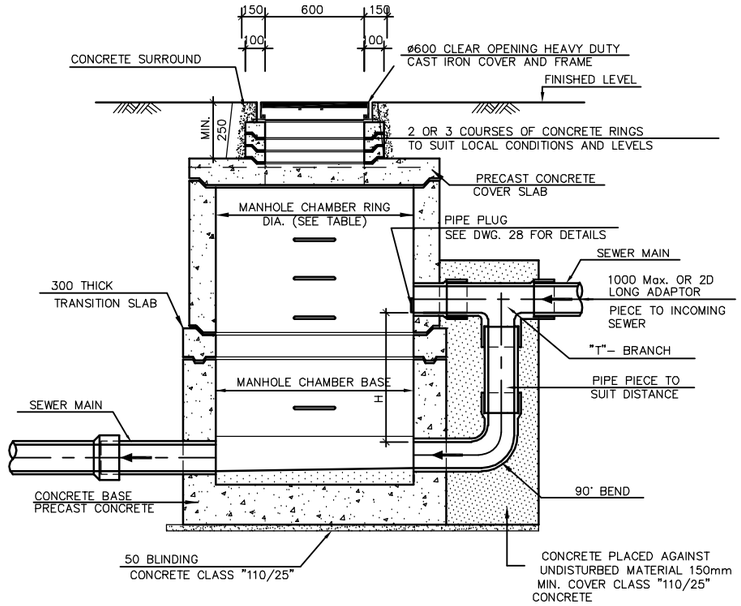




PLAN
N.T.S.



SECTION A-A
H < 1500 mm



SECTION A-A
H > 1500 mm

تفاصيل السقوط الخلفى لمطابق مسبقة الصب لعمق السقوط حتى ١٥٠٠مم

DETAILS OF PRECAST BACKDROP MANHOLE FOR DROP < 15Q0MM

تفاصيل السقوط الخلفى لمطابق مسبقة الصب لعمق السقوط اكبر من ١٥٠٠مم

DETAILS OF PRECAST BACKDROP MANHOLE FOR DROP > 1500MM

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
PRECAST BACKDROP MANHOLE DETAILS

اسم الخريطة :
تفاصيل السقوط الخلفي لمطابق مسبقة الصب

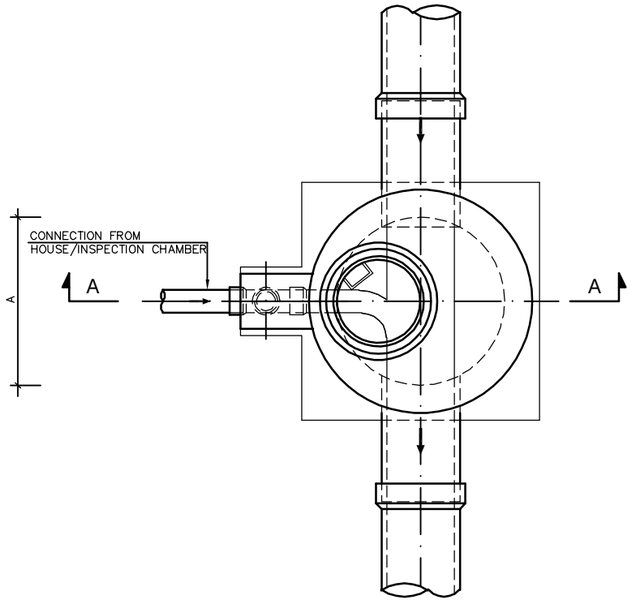
Project No: S19158

Drawing No: 09

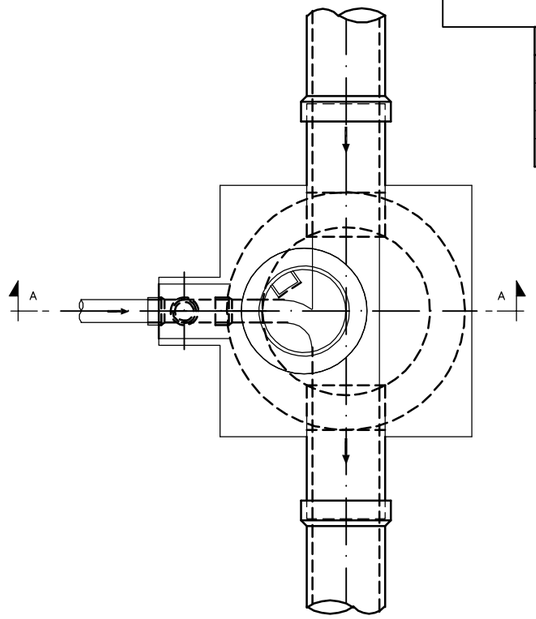
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

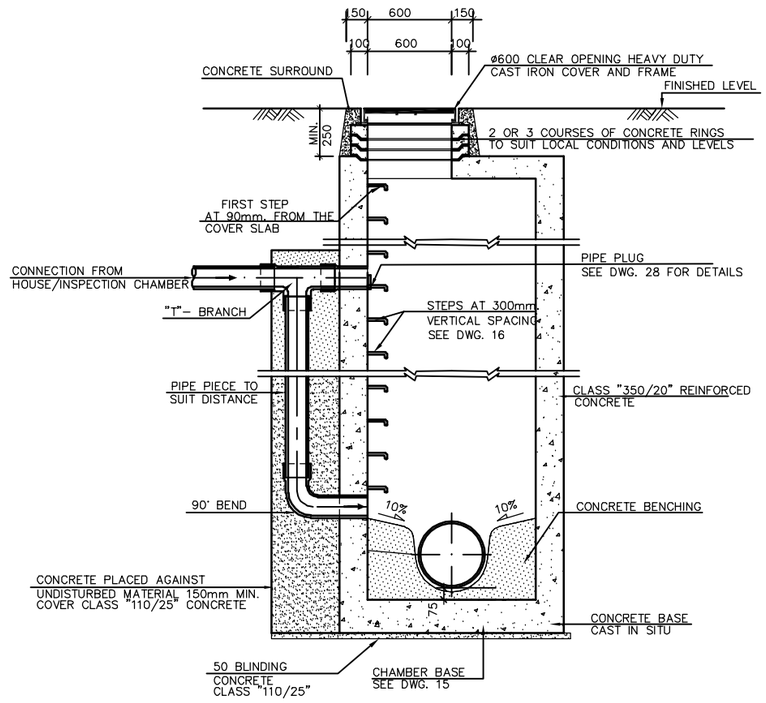
MANHOLE CHAMBER SIZE	
DIAMETER OF PIPE	CONCRETE RING
200 – 600 mm.	ø 1200 mm.
700 – 900 mm.	ø 2000 mm.
1000 – 1500 mm.	ø 2500 mm.



PLAN



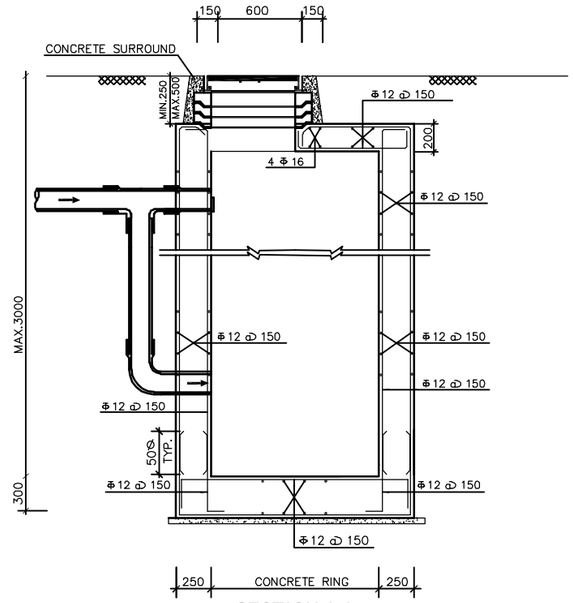
PLAN
N.T.S.



SECTION A-A

تفاصيل المناهل المصبوبة بالموقع بعمق حتى ٣٠٠٠ مم

CAST IN SITU MANHOLE DETAILS FOR DEPTH < 3000MM



SECTION A-A
N.T.S.

تفاصيل تسليح المناهل المصبوبة بالموقع بعمق حتى ٣٠٠٠ مم

REINFORCEMENT DETAILS FOR CAST IN SITU MANHOLE FOR DEPTH < 3000MM

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

CAST IN SITU MANHOLE DETAILS FOR DEPTH < 3000mm

اسم الخريطة :

تفاصيل المناهل المصبوبة بالموقع بعمق أقل من ٣٠٠٠مم

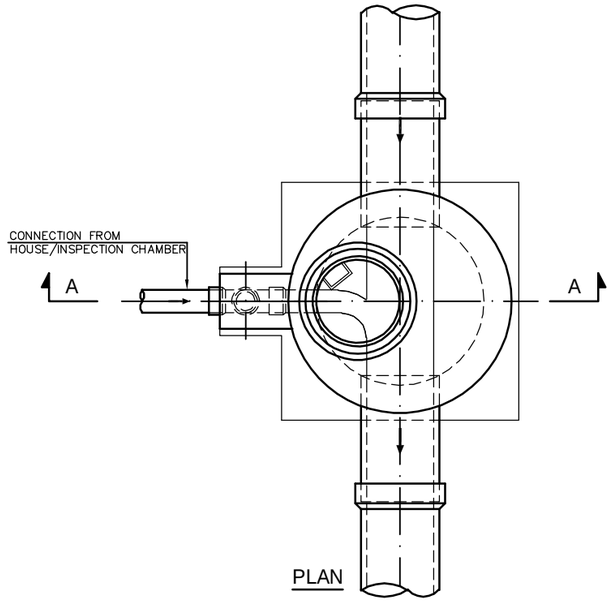
Project No: S19158

Drawing No: 10

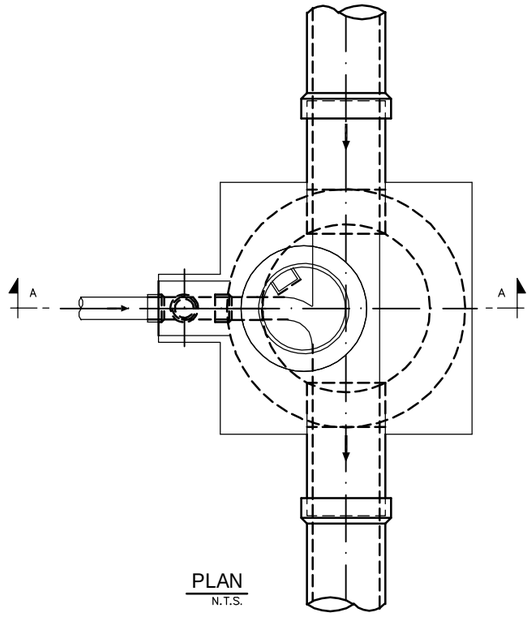
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

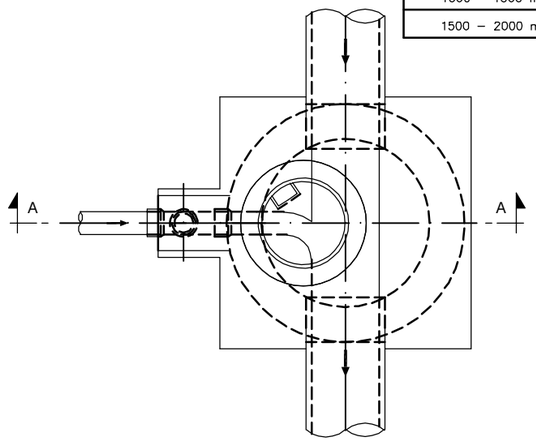
MANHOLE CHAMBER SIZE	
DIAMETER OF PIPE	CONCRETE RING
200 – 600 mm.	ø 1200 mm.
700 – 900 mm.	ø 2000 mm.
1000 – 1500 mm.	ø 2500 mm.
1500 – 2000 mm.	ø 4000 mm.



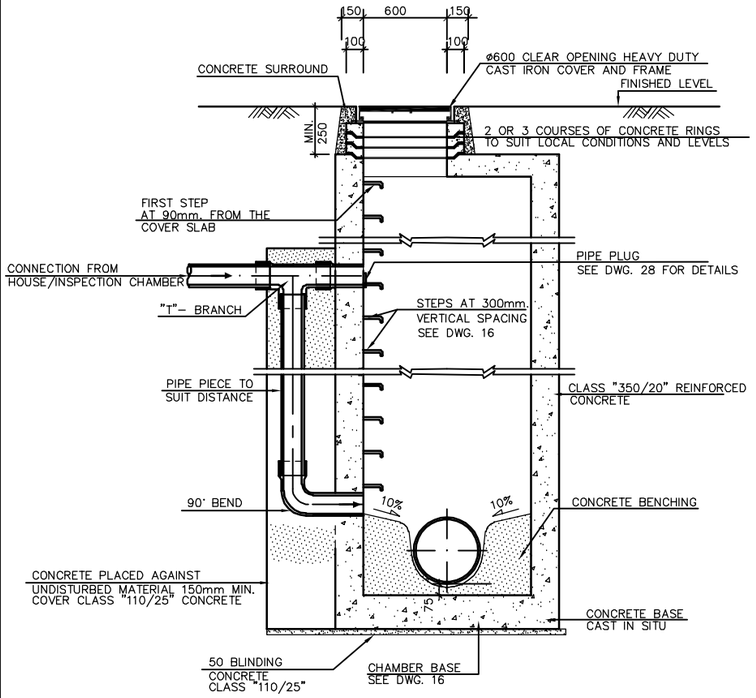
PLAN



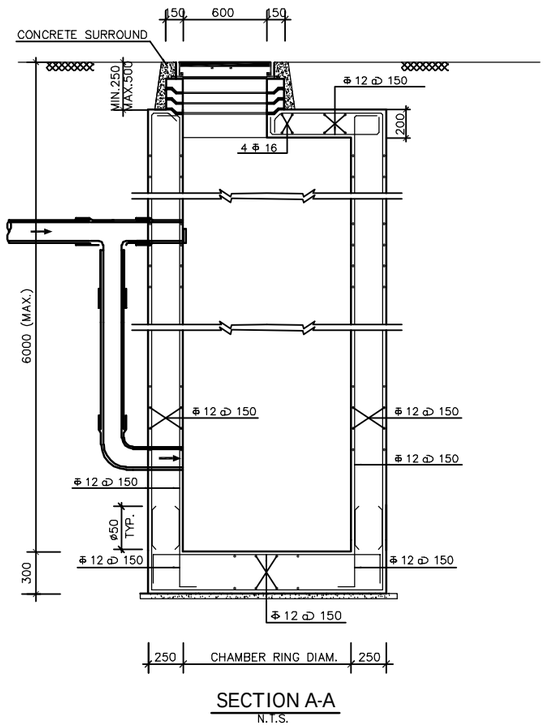
PLAN
N.T.S.



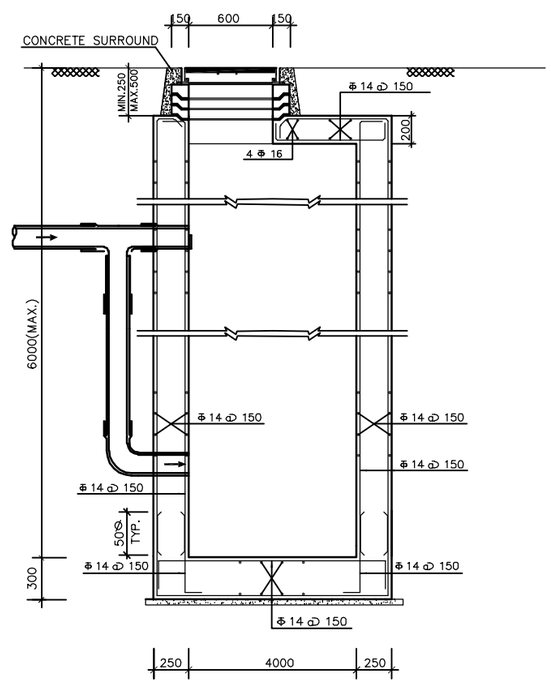
PLAN
N.T.S.



SECTION A-A



SECTION A-A
N.T.S.



SECTION A–A
N.T.S.

تفاصيل المناهل المصبوبة بالموقع بعمق من ٣٠٠٠ مم وحتى ٦٠٠٠ مم

CAST IN SITU MANHOLE DETAILS FOR DEPTH FROM 3000 TO 6000MM

تفاصيل تسليح المناهل المصبوبة بالموقع بعمق من ٣٠٠٠ مم وحتى ٦٠٠٠ مم

REINFORCEMENT DETAILS FOR CAST IN SITU MANHOLE FOR DEPTH FROM 3000 TO 6000MM

nwc المياه الوطنية

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

CAST IN SITU MANHOLE
DETAILS FOR
3000 - 6000mm

اسم الخريطة :

تفاصيل المناهل المصبوبة
بالموقع بعمق من
٣٠٠٠مم وحتى ٦٠٠٠مم

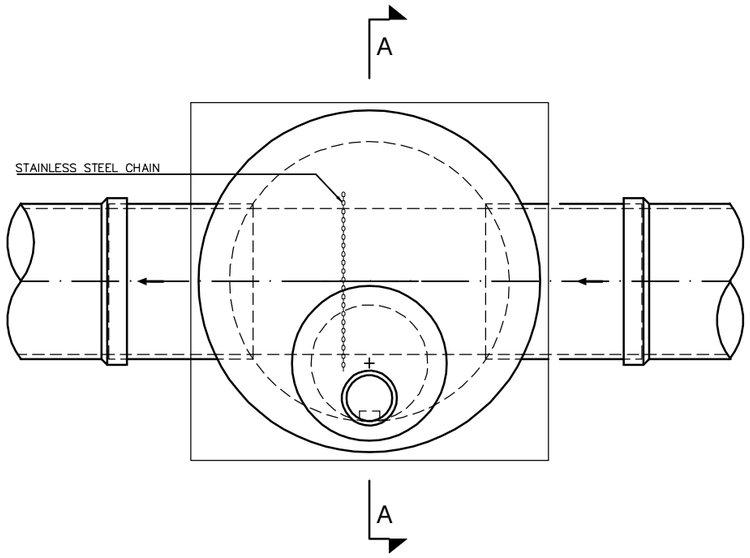
Project No: S19158

Drawing No: 11

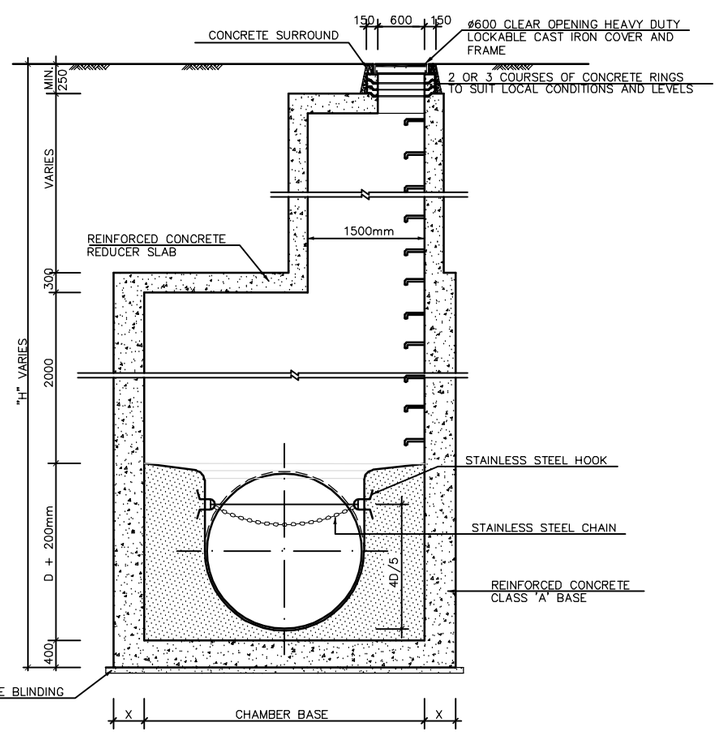
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

MANHOLE CHAMBER SIZE	
DIAMETER OF PIPE	CHAMBER BASE
< 500 mm.	ø 1500 mm.
500 – 1600 mm.	ø D+1000 mm.
> 1600 mm.	ø D+1600 mm.



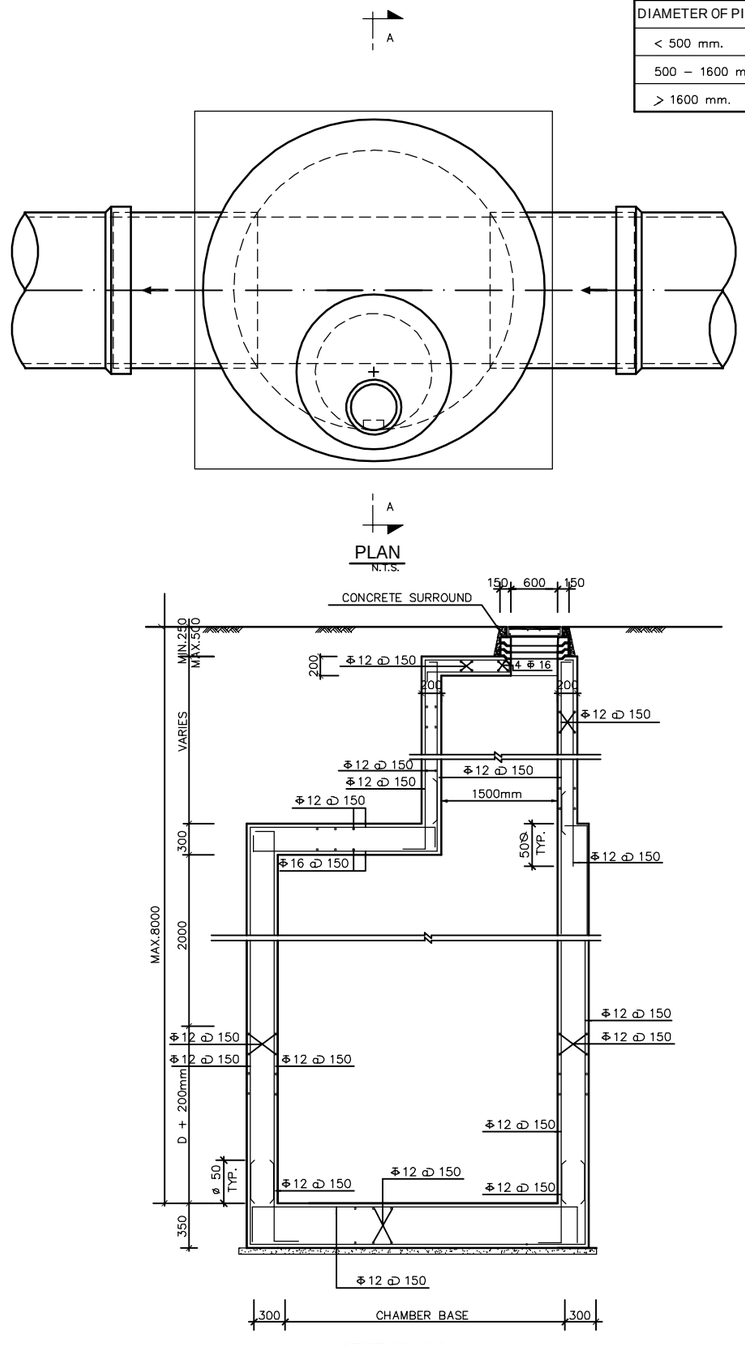
PLAN



SECTION A-A

تفاصيل المناهل العميقة المصبوبة بالموقع بعمق من ٦٠٠٠مم وحتى ٨٠٠٠مم

CAST IN SITU DEEP MANHOLE DETAILS FOR DEPTH FROM 6000 TO 8000MM



SECTION A-A
N.T.S.

تفاصيل تسليح المناهل العميقة المصبوبة بالموقع بعمق من ٦٠٠٠مم وحتى ٨٠٠٠مم

REINFORCEMENT DETAILS FOR CAST IN SITU DEEP MANHOLE FOR DEPTH FROM 6000 TO 8000MM

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

CAST IN SITU DEEP MANHOLE DETAILS FOR DEPTH 6000 - 8000mm

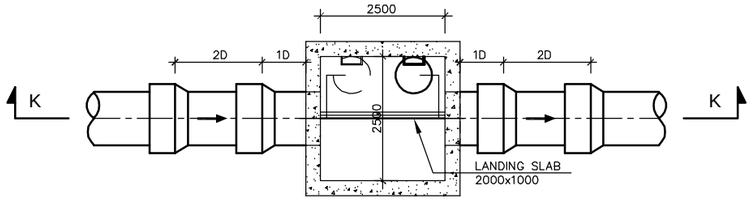
اسم الخريطة :

تفاصيل المناهل العميقة المصبوبة بالموقع بعمق من ٦٠٠٠م وحتى ٨٠٠٠م

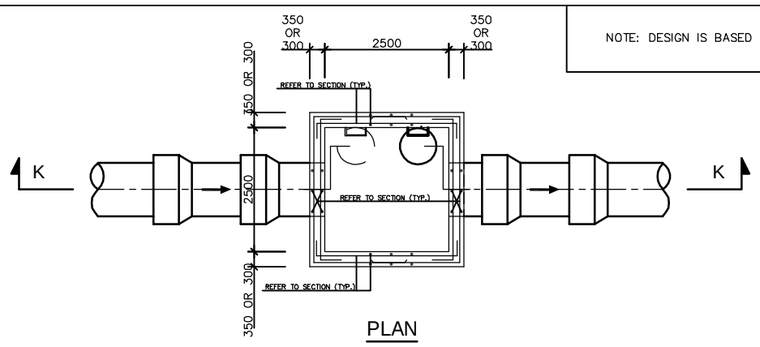
Project No: S19158

Drawing No: 12

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020



PLAN



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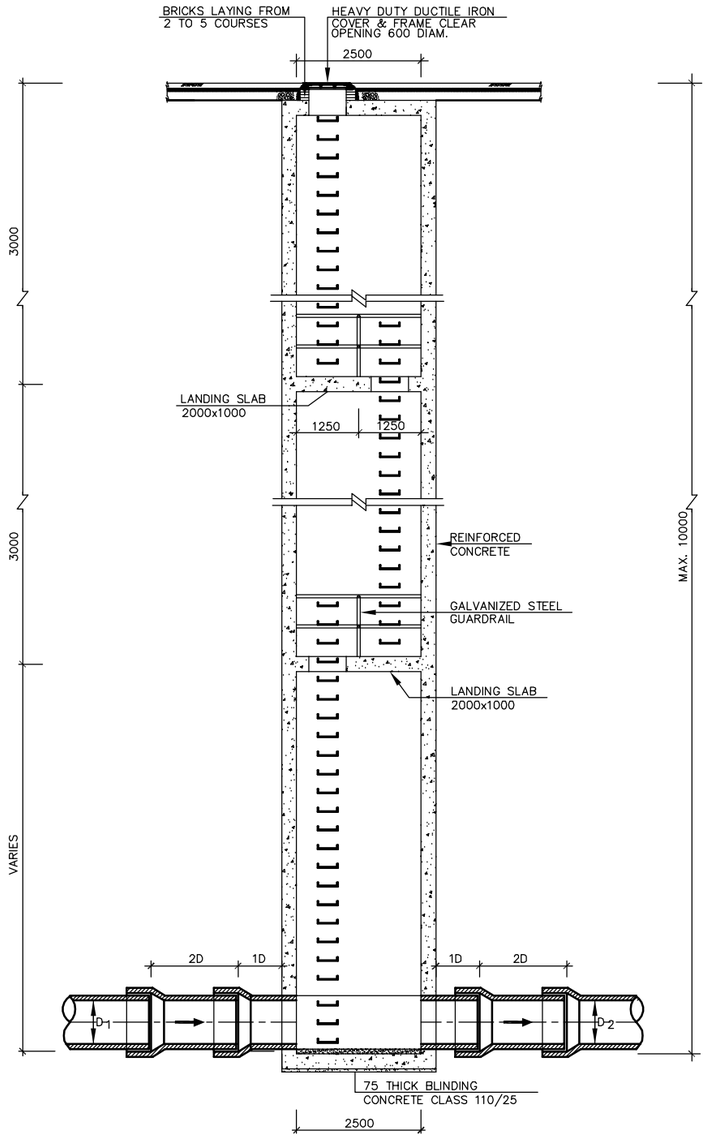
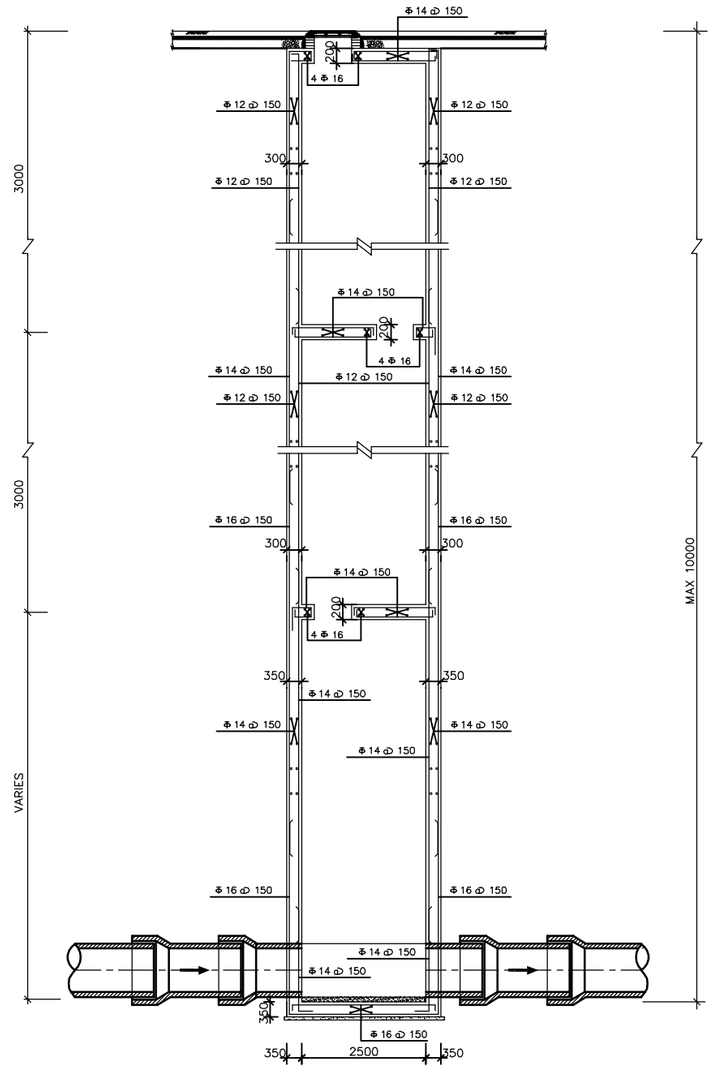


SECTION K-K

تفاصيل المناهل العميقة المصبوبة بالموقع بعمق من ٨٠٠٠مم وحتى ١٠٠٠٠مم

CAST IN SITU DEEP MANHOLE DETAILS FOR DEPTH FROM 8000 TO 10000MM



SECTION K-K

تفاصيل المناهل العميقة المصبوبة بالموقع بعمق من ٨٠٠٠مم وحتى ١٠٠٠٠مم

CAST IN SITU DEEP MANHOLE DETAILS FOR DEPTH FROM 8000 TO 10000MM

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

CAST IN SITU DEEP MANHOLE DETAILS FOR DEPTH 8000 - 10000mm

اسم الخريطة :

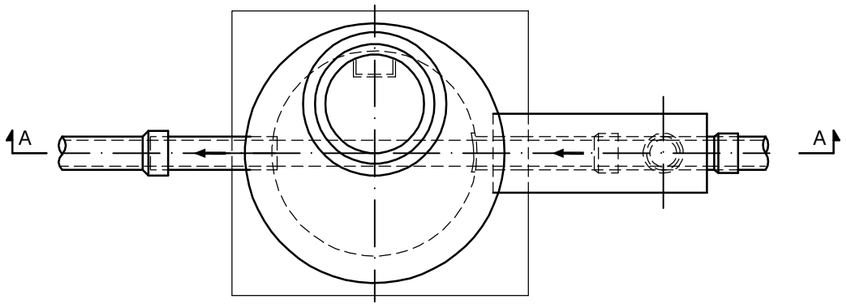
تفاصيل المناهل العميقة المصبوبة بالموقع بعمق من ٨٠٠٠مم وحتى ١٠٠٠٠مم

Project No: S19158

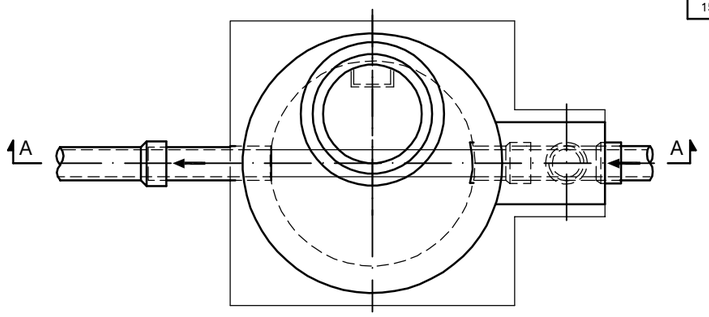
Drawing No: 13

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

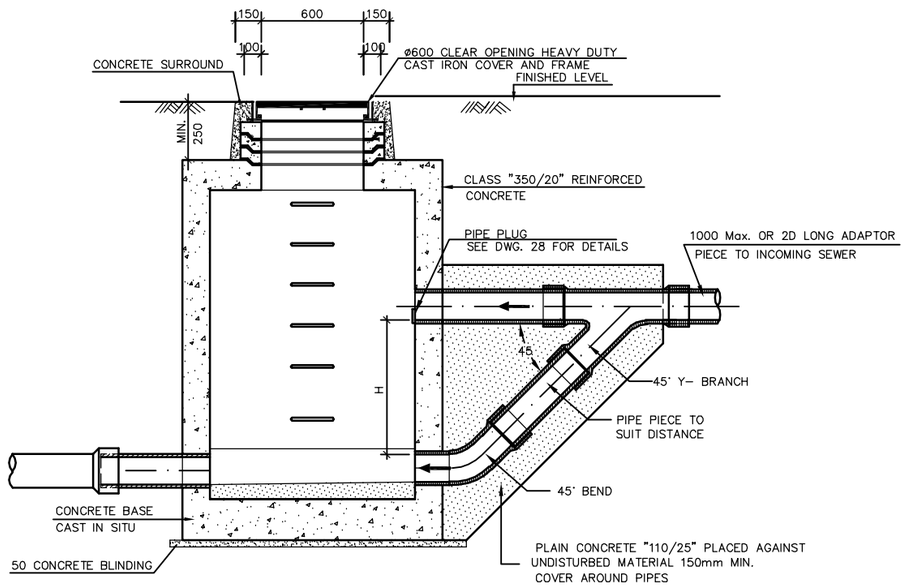
MANHOLE CHAMBER SIZE	
DIAMETER OF PIPE	CONCRETE RING
200 – 600 mm.	1200 mm.
700 – 900 mm.	2000 mm.
1000 – 1500 mm.	2500 mm.
1500 – 2000 mm.	4000 mm.



PLAN



PLAN
N.T.S.

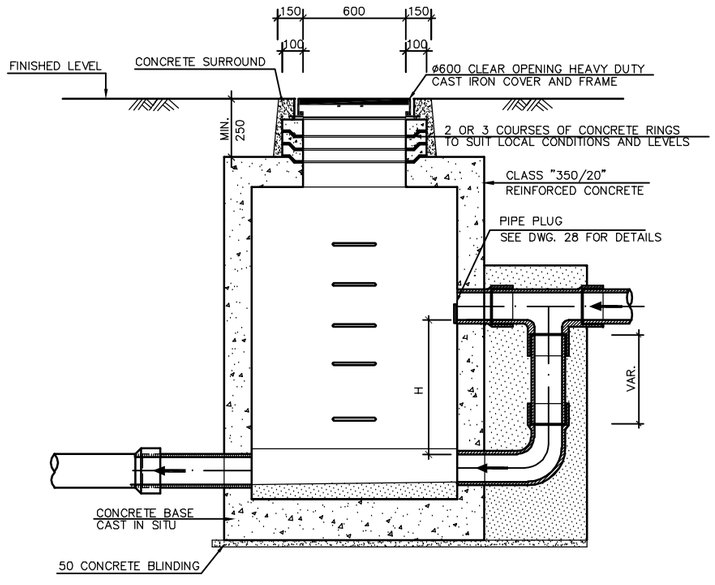


NOTE: H: IS THE HEIGHT OF DROP

SECTION A-A

تفاصيل المناهل المصبوبة بالموقع ذات سقوط خلفى حتى ١٥٠٠ مم

DETAILS OF CAST IN SITU BACKDROP MANHOLES FOR DROP < 1500MM



SECTION A-A

تفاصيل تسليح المناهل المصبوبة بالموقع ذات سقوط خلفى اكبر من ١٥٠٠ مم

DETAILS FOR CAST IN SITU BACKDROP MANHOLE FOR DROP > 1500MM

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

CAST IN SITU BACKDROP MANHOLE DETAILS

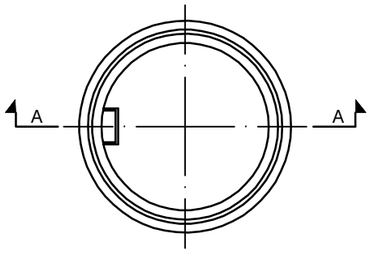
اسم الخريطة :

تفاصيل المناهل المصبوبة بالموقع ذات سقوط خلفي

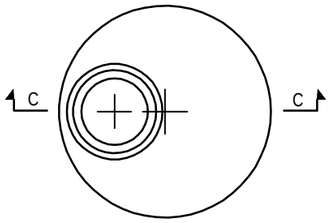
Project No: S19158

Drawing No: 14

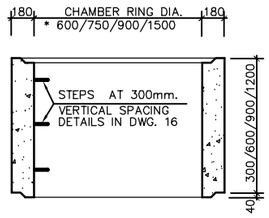
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020



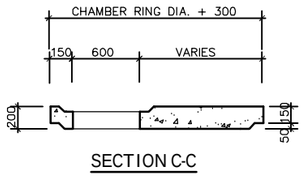
PLAN



PLAN

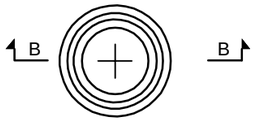


SECTION A-A

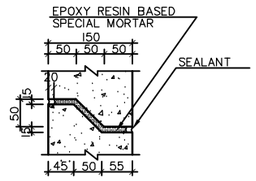


SECTION C-C

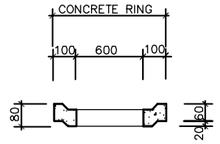
COVER SLAB



PLAN

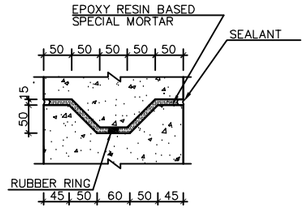


DETAIL "A"



SECTION B-B

CONCRETE RING



DETAIL "B"

* USE 600mm FOR INSPECTION CHAMBER ONLY

التفاصيل القياسية للطوق العلوى للغرف والمناهل

STANDARD CHAMBER AND MANHOLE RING DETAILS

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسـم المشـروع:
المواصـفات الفنيـة وجـداول الكميـات القياسـية والمخططـات لشـبكات الميـاه والصـرف الصـحي والأعمـال الملحقـة

Notes:

SEWAGE NETWORK DETAILS

المخططـات القياسـية لشـبكات الصـرف الصـحي

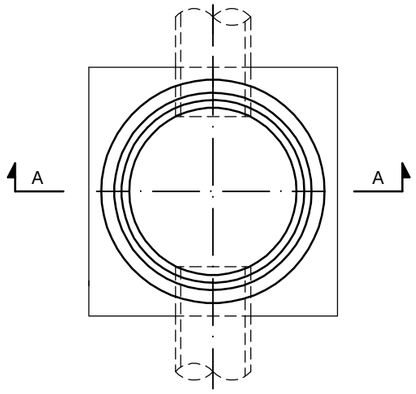
Drawing Name:
STANDARD CHAMBER AND MANHOLE RING DETAILS

اسـم الخريطـة :
التفاصـيل القياسـية للطـوق العلـوي للغـرف والمناهـل

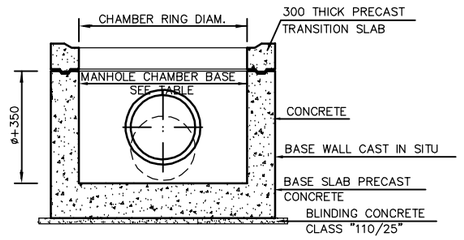
Project No: S19158

Drawing No: 15

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020



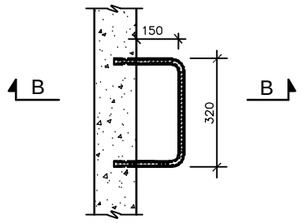
MANHOLE CHAMBER BASE
TOP VIEW



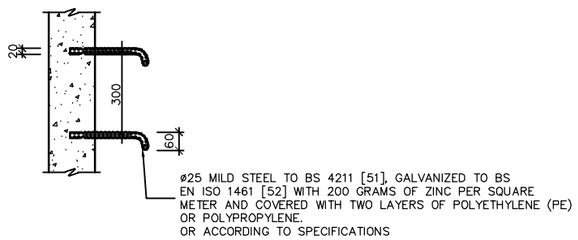
SECTION A-A

NOTE
MINIMUM ELEVATION DIFFERENCE WITHIN MANHOLES IS 20mm

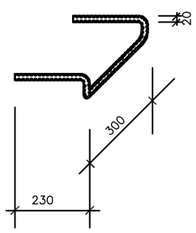
تفاصيل قاعدة المناهل
MANHOLE CHAMBER BASE DETAIL



PLAN


20
300
60
ø25 MILD STEEL TO BS 4211 [51], GALVANIZED TO BS EN ISO 1461 [52] WITH 200 GRAMS OF ZINC PER SQUARE METER AND COVERED WITH TWO LAYERS OF POLYETHYLENE (PE) OR POLYPROPYLENE.
OR ACCORDING TO SPECIFICATIONS

SECTION B-B



ELEVATION

تفاصيل الدرجات
MANHOLE SAFETY STEP DETAILS

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

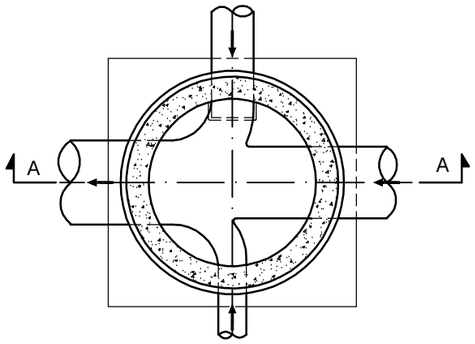
Drawing Name:
MANHOLE BASE AND STEPS DETAILS

اسم الخريطة :
تفاصيل قاعدة المناهل والدراجات

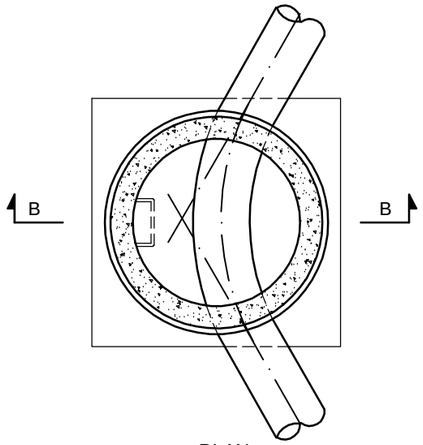
Project No: **S19158**

Drawing No: 16

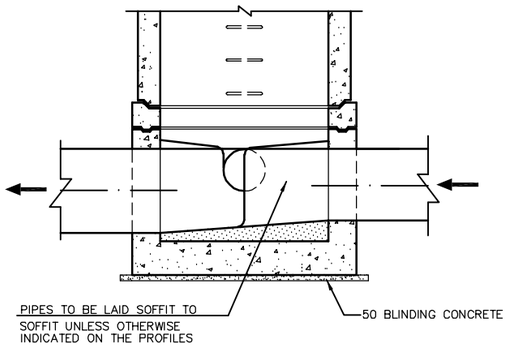
Date: **RABI' AL-AWWAL 1442**
NOVEMBER 2020



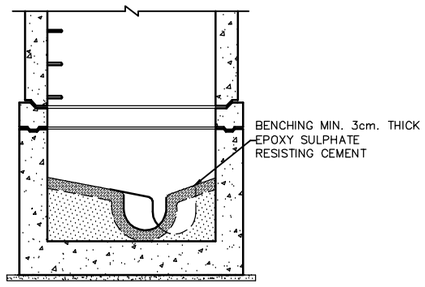
PLAN



PLAN



SECTION A-A



SECTION B-B

تفاصيل التقاطعات عند المطابق
TYPICAL JUNCTION MANHOLE DETAIL

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
TYPICAL JUNCTION DETAILS

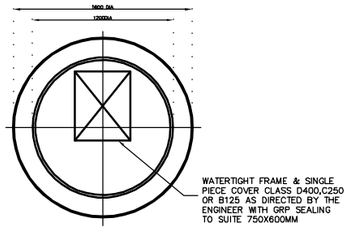
اسم الخريطة :
تفاصيل التقاطعات عند المطابق

Project No: S19158

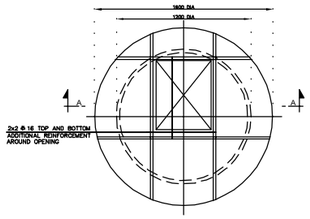
Drawing No: 17

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

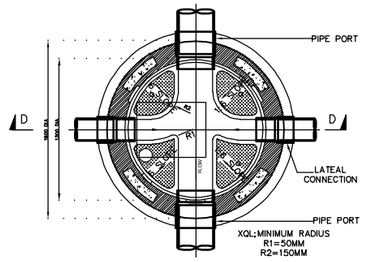
NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.


1600 DIA
1200DIA
WATERTIGHT FRAME & SINGLE PIECE COVER CLASS D400,C250 OR B125 AS DIRECTED BY THE ENGINEER WITH GRP SEALING TO SUITE 750X600MM

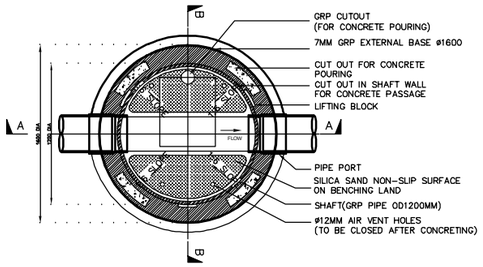
PLAN AT COVER LEVEL



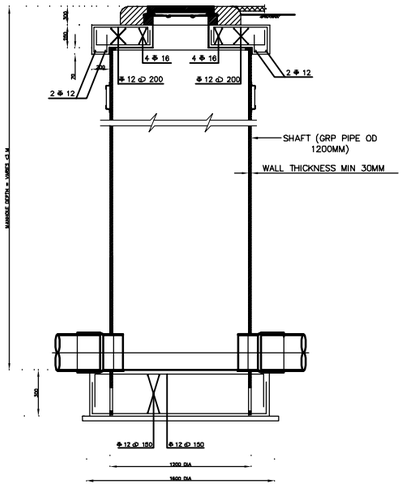
PLAN AT COVER LEVEL



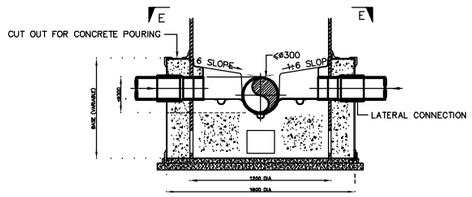
SECTION PLAN E–E



SECTION PLAN C–C

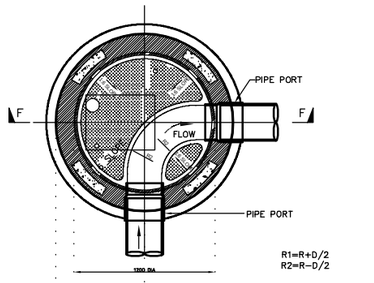


SECTION A–A



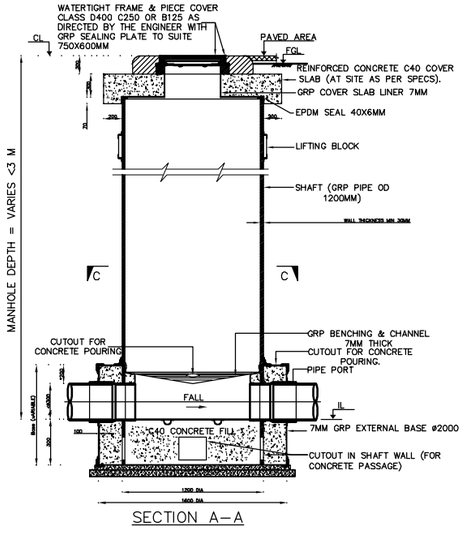
SECTION D–D

TYPICAL DETAIL OF LATERAL CONNECTIONS



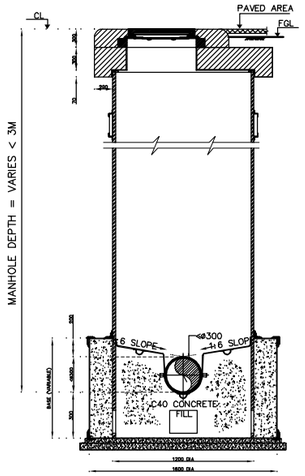
SECTION PLAN G–G

TYPICAL DETAIL FOR 90° BEND AT MANHOLE

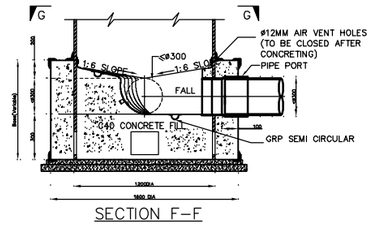

WATERTIGHT FRAME & PIECE COVER CLASS D400 C250 OR B125 AS DIRECTED BY THE ENGINEER WITH GRP SEALING PLATE TO SUITE 750X600MM
CL
PAVED AREA
FGL
REINFORCED CONCRETE C40 COVER SLAB (AT SITE AS PER SPECS).
GRP COVER SLAB LINER 7MM
EPDM SEAL 40X6MM
LIFTING BLOCK
SHAFT (GRP PIPE OD 1200MM)
WALL THICKNESS MIN 30MM
MANHOLE DEPTH = VARIES <3 M
C
C
CUTOUT FOR CONCRETE POURING
GRP BENCHING & CHANNEL 7MM THICK
CUTOUT FOR CONCRETE POURING.
PIPE PORT
FALL
IL
C40 CONCRETE FILL
7MM GRP EXTERNAL BASE ø2000
CUTOUT IN SHAFT WALL (FOR CONCRETE PASSAGE)
1200 DIA
1600 DIA

SECTION A–A

* MAY VARY DEPENDING ON ANTIFLOTATION REQUIREMENT BASED ON SITE WATER TABLE.



SECTION B–B



SECTION F–F

NOTES

1- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

2- ALL CONCRETE TO BE C40 UNLESS OTHERWISE STATED.

3- MANHOLES ARE TO BE WATERTIGHT.

4- FOR SEWER CONNECTION DETAILS REFER TO CONNECTION DETAILS FOR SEWERAGE MANHOLES & CHAMBERS.

5- FOR COVER AND ACCESS DETAILS REFER TO COVER DETAILS FOR FOUL SEWERAGE MANHOLES & CHAMBERS.

6- SEWER GRADIENTS TO BE MAINTAINED THROUGH CHANNELS.

7- ALL GRP STRUCTURAL MANHOLES SHALL BE INCORPORATED WITH LIFTING BLOCKS FOR HANDLING.

8- PORT CONFIGURATION SHALL BE TO MATCH ALL CONNECTING INCOMING AND OUTGOING PIPE LINE.

9- GRP MANHOLE SHAFT SHALL BE MADE FROM GRP PIPE HAVING MINIMUM STIFENESS OF 10000 N/M².

10-GRP MANHOLE SHAFT HAVE A MINIMUM SPECIFIC INITIAL LONGITUDINAL COMPRESSIVE STRENGTH AT BREAK OF 80 MPA (MN/M²)

11-ALL CUT-OUTS / HOLES & AIR VENT HOLES FOR CONCRETE TO BE CLOSED BY GRP LAMINATION AFTER THE CURING OF CONCRETE.

12-EXTERNAL BASE DIMENSIONS TO BE BASED ON ANTI-FLOATATION REQUIREMENT.

13-SHAFT THICKNESS AS SHOWN IS ONLY FOR REFERENCE AND CONSIDERED AS MIN. REQUIRED. CONTRACTOR TO VERIFY ALL RESPECTIVE DIMENSIONS BASED ON SUPPLIER RECOMMENDATION ALL IN ACCORDANCE TO THE RELEVANT INTERNATIONAL STANDARDS AND TYPE TESTS AS PER NWC PROJECTS REQUIREMENT.

تفاصيل المناهل البلاستيك المقوى بألياف زجاجية لقطر١٢٠٠مم

GRP STRUCTURAL MANHOLE FOR DIAMETER 1200MM

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

GRP STRUCTURAL MANHOLE FOR DIAMETER 1200mm

اسم الخريطة :

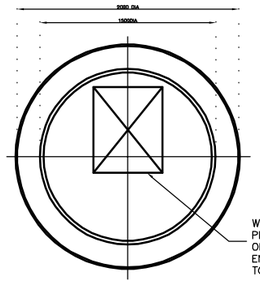
تفاصيل المناهل البلاستيك المقوى بألياف زجاجية لقطر ١٢٠٠مم

Project No: S19158

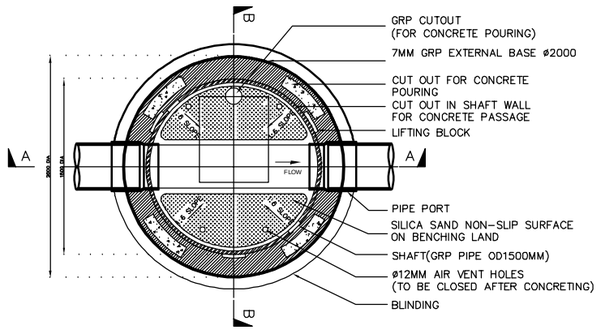
Drawing No: 17A

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

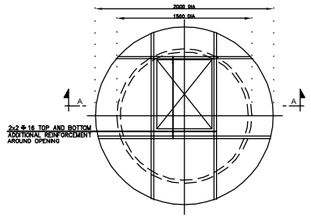
NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.


WATERTIGHT FRAME & SINGLE PIECE COVER CLASS D400,C250 OR B125 AS DIRECTED BY THE ENGINEER WITH GRP SEALING TO SUITE 750X600MM

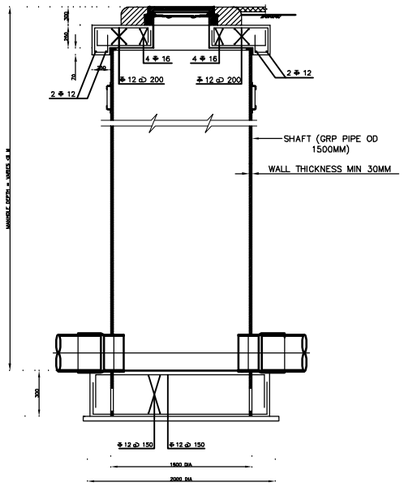
PLAN AT COVER LEVEL


GRP CUTOUT (FOR CONCRETE POURING)
7MM GRP EXTERNAL BASE ø2000
CUT OUT FOR CONCRETE POURING
CUT OUT IN SHAFT WALL FOR CONCRETE PASSAGE
LIFTING BLOCK
PIPE PORT
SILICA SAND NON-SLIP SURFACE ON BENCHING LAND
SHAFT(GRP PIPE OD1500MM)
ø12MM AIR VENT HOLES (TO BE CLOSED AFTER CONCRETING)
BLINDING
FLOW

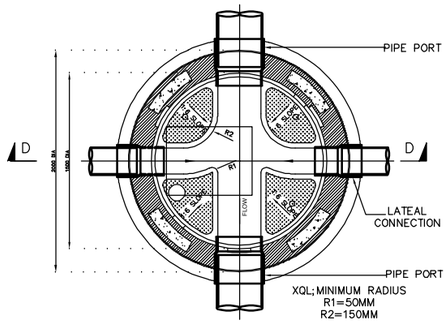
SECTION PLAN C–C



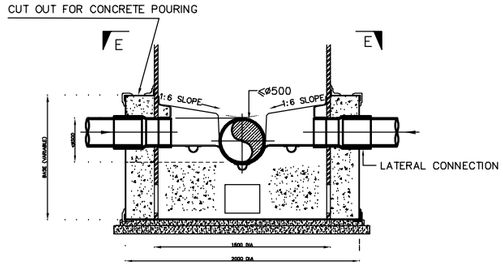
PLAN AT COVER LEVEL



SECTION A–A

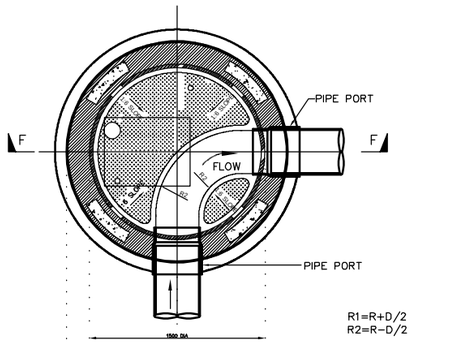


SECTION PLAN E–E



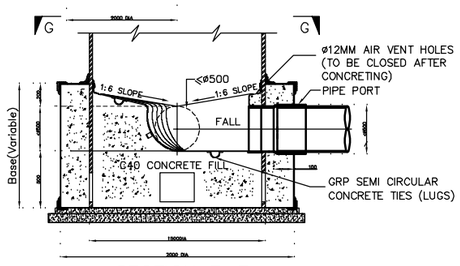
SECTION D–D

TYPICAL DETAIL OF LATERAL CONNECTIONS

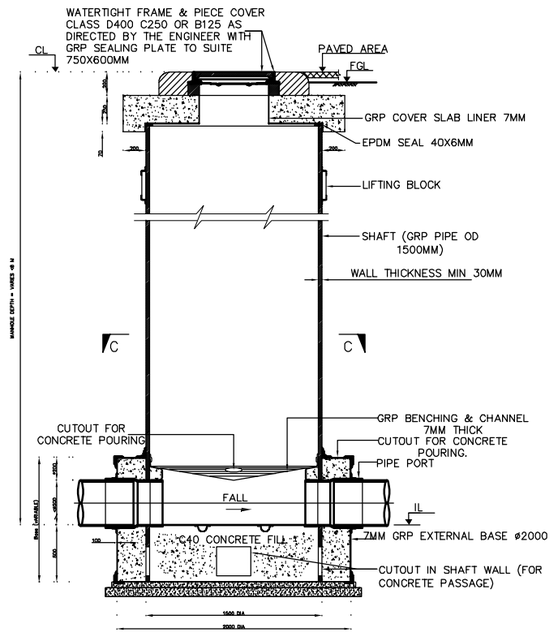


SECTION PLAN G–G

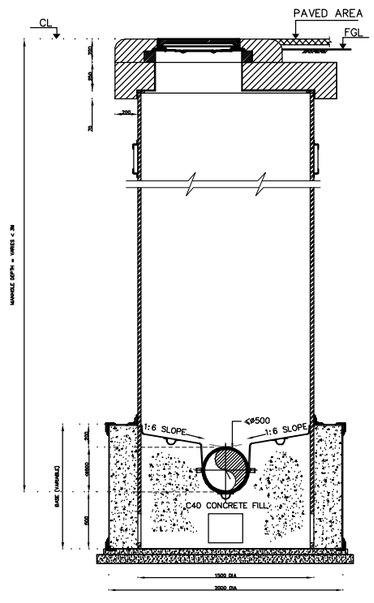
TYPICAL DETAIL FOR 90° BEND AT MANHOLE



SECTION F–F


WATERTIGHT FRAME & PIECE COVER CLASS D400 C250 OR B125 AS DIRECTED BY THE ENGINEER WITH GRP SEALING PLATE TO SUITE 750x600MM
PAVED AREA
FGL
GRP COVER SLAB LINER 7MM
EPDM SEAL 40X6MM
LIFTING BLOCK
SHAFT (GRP PIPE OD 1500MM)
WALL THICKNESS MIN 30MM
CUTOUT FOR CONCRETE POURING
GRP BENCHING & CHANNEL 7MM THICK
CUTOUT FOR CONCRETE POURING.
PIPE PORT
FALL
IL
C40 CONCRETE FILL
7MM GRP EXTERNAL BASE ø2000
CUTOUT IN SHAFT WALL (FOR CONCRETE PASSAGE)

SECTION A–A



SECTION B–B

* MAY VARY DEPENDING ON ANTIFLOTATION REQUIREMENT BASED ON SITE WATER TABLE.

NOTES

1- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

2- ALL CONCRETE TO BE C40 UNLESS OTHERWISE STATED.

3- MANHOLES ARE TO BE WATERTIGHT.

4- FOR SEWER CONNECTION DETAILS REFER TO CONNECTION DETAILS FOR SEWERAGE MANHOLES & CHAMBERS.

5- FOR COVER AND ACCESS DETAILS REFER TO COVER DETAILS FOR FOUL SEWERAGE MANHOLES & CHAMBERS.

6- SEWER GRADIENTS TO BE MAINTAINED THROUGH CHANNELS.

7- ALL GRP STRUCTURAL MANHOLES SHALL BE INCORPORATED WITH LIFTING BLOCKS FOR HANDLING.

8- PORT CONFIGURATION SHALL BE TO MATCH ALL CONNECTING INCOMING AND OUTGOING PIPE LINE.

9- GRP MANHOLE SHAFT SHALL BE MADE FROM GRP PIPE HAVING MINIMUM STIFENESS OF 10000 N/M².

10-GRP MANHOLE SHAFT HAVE A MINIMUM SPECIFIC INITIAL LONGITUDINAL COMPRESSIVE STRENGTH AT BREAK OF 80 MPA (MN/M²)

11-ALL CUT-OUTS / HOLES & AIR VENT HOLES FOR CONCRETE TO BE CLOSED BY GRP LAMINATION AFTER THE CURING OF CONCRETE.

12-EXTERNAL BASE DIMENSIONS TO BE BASED ON ANTI-FLOATATION REQUIREMENT.

13-SHAFT THICKNESS AS SHOWN IS ONLY FOR REFERENCE AND CONSIDERED AS MIN. REQUIRED. CONTRACTOR TO VERIFY ALL RESPECTIVE DIMENSIONS BASED ON SUPPLIER RECOMMENDATION ALL IN ACCORDANCE TO THE RELEVANT INTERNATIONAL STANDARDS AND TYPE TESTS AS PER NWC PROJECTS REQUIREMENT.

تفاصيل المناهل البلاستيك المقوى بألياف زجاجية لقطر١٥٠٠مم

GRP STRUCTURAL MANHOLE FOR DIAMETER 1500MM

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
GRP STRUCTURAL MANHOLE FOR DIAMETER 1500mm

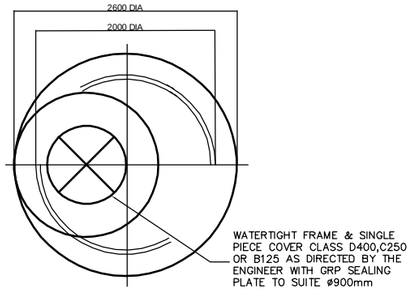
اسم الخريطة :
تفاصيل المناهل البلاستيك المقوى بألياف زجاجية لقطر١٥٠٠مم

Project No: S19158

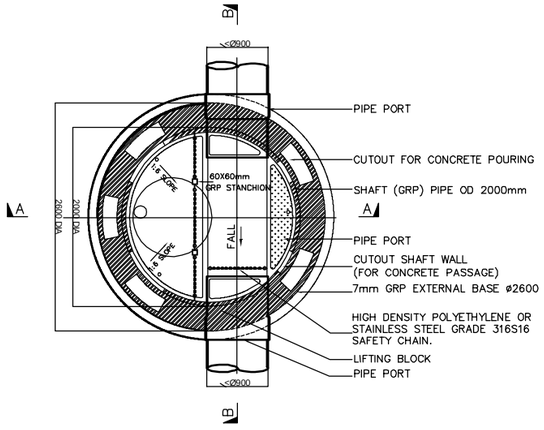
Drawing No: 17B

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

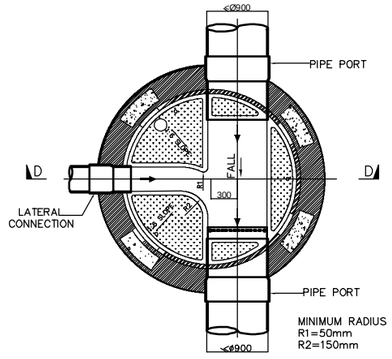
NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.


2600 DIA
2000 DIA
WATERTIGHT FRAME & SINGLE PIECE COVER CLASS D400,C250 OR B125 AS DIRECTED BY THE ENGINEER WITH GRP SEALING PLATE TO SUITE ø900mm

PLAN AT COVER LEVEL



SECTION PLAN C–C



SECTION PLAN E–E

NOTES

1- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

2- ALL CONCRETE TO BE C40 UNLESS OTHERWISE STATED.

3- MANHOLES ARE TO BE WATERTIGHT.

4- FOR SEWER CONNECTION DETAILS REFER TO CONNECTION DETAILS FOR SEWERAGE MANHOLES & CHAMBERS.

5- FOR COVER AND ACCESS DETAILS REFER TO COVER DETAILS FOR FOUL SEWERAGE MANHOLES & CHAMBERS.

6- SEWER GRADIENTS TO BE MAINTAINED THROUGH CHANNELS.

7- ALL GRP STRUCTURAL MANHOLES SHALL BE INCORPORATED WITH LIFTING BLOCKS FOR HANDLING.

8- PORT CONFIGURATION SHALL BE TO MATCH ALL CONNECTING INCOMING AND OUTGOING PIPE LINE.

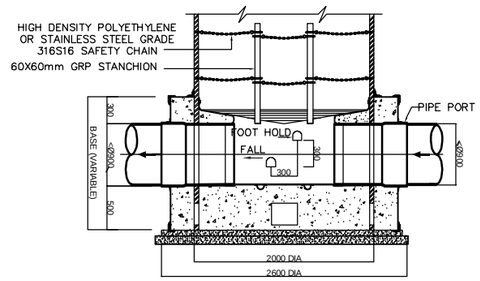
9- GRP MANHOLE SHAFT SHALL BE MADE FROM GRP PIPE HAVING MINIMUM STIFENESS OF 10000 N/M².

10-GRP MANHOLE SHAFT HAVE A MINIMUM SPECIFIC INITIAL LONGITUDINAL COMPRESSIVE STRENGTH AT BREAK OF 80 MPA (MN/M²)

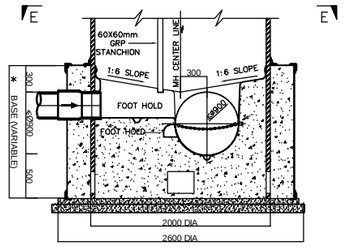
11-ALL CUT-OUTS / HOLES & AIR VENT HOLES FOR CONCRETE TO BE CLOSED BY GRP LAMINATION AFTER THE CURING OF CONCRETE.

12-EXTERNAL BASE DIMENSIONS TO BE BASED ON ANTI-FLOATATION REQUIREMENT.

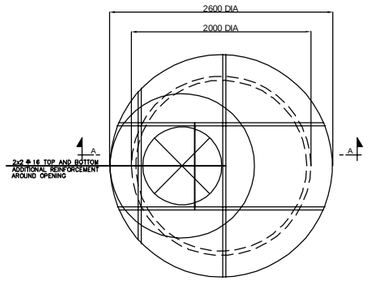
13-SHAFT THICKNESS AS SHOWN IS ONLY FOR REFERENCE AND CONSIDERED AS MIN. REQUIRED. CONTRACTOR TO VERIFY ALL RESPECTIVE DIMENSIONS BASED ON SUPPLIER RECOMMENDATION ALL IN ACCORDANCE TO THE RELEVANT INTERNATIONAL STANDARDS AND TYPE TESTS AS PER NWC PROJECTS REQUIREMENT.



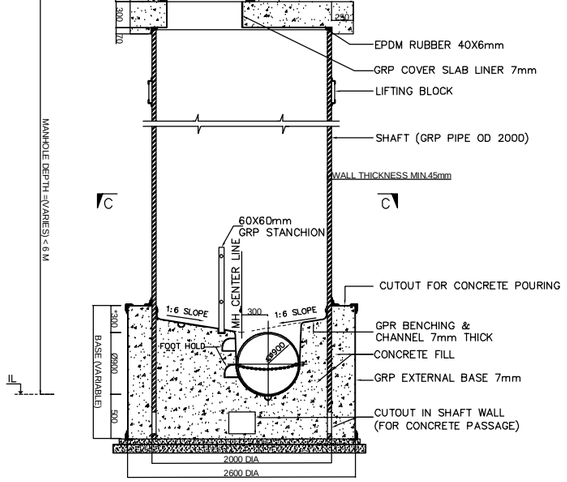
SECTION B–B



SECTION D–D
TYPICAL DETAIL OF LATERAL CONNECTIONS

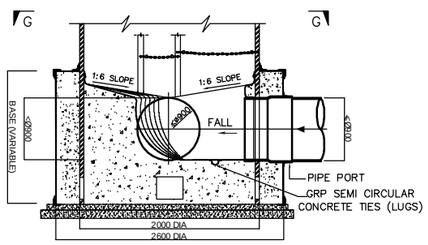


PLAN AT COVER LEVEL

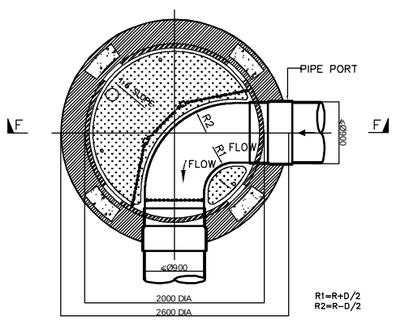


SECTION A–A

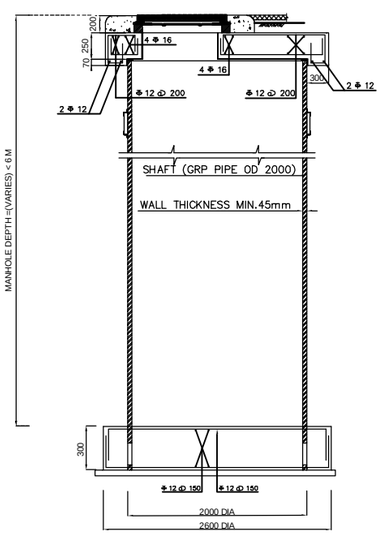
* MAY VARY DEPENEDING ON ANTIFLOTATION REQUIREMENT BASED ON SITE WATER TABLE.



SECTION F–F



SECTION PLAN G–G
TYPICAL DETAIL FOR 90° BEND AT MANHOLE



SECTION A–A

تفاصيل المناهل البلاستيك المقوى بألياف زجاجية لقطر ٢٠٠٠مم

GRP STRUCTURAL MANHOLE FOR DIAMETER 2000MM

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
GRP STRUCTURAL MANHOLE FOR DIAMETER 2000mm

اسم الخريطة :
تفاصيل المناهل البلاستيك المقوى بألياف زجاجية لقطر ٢٠٠٠مم

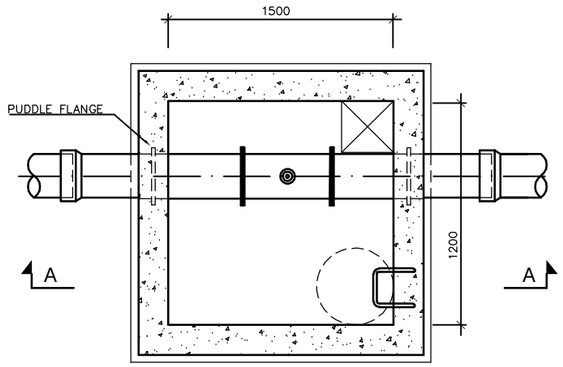
Project No: S19158

Drawing No: 17C

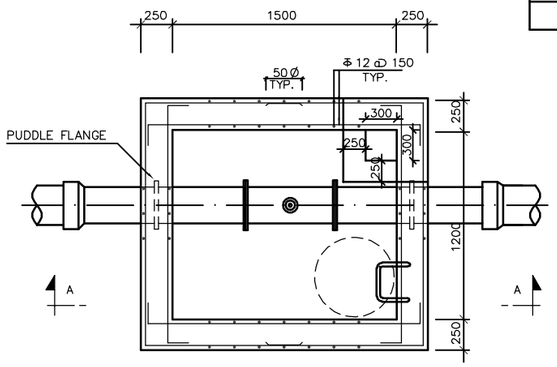
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

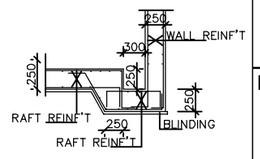
DIA. OF SEWAGE FORCE MAIN (MM)	AIR VALVE SIZE (mm)
LESS THAN 300 mm.	40
300 – 600 mm.	60
700 – 900 mm.	100
1000 – 1200 mm.	150



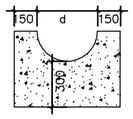
PLAN



PLAN



SUMP PIT SECTION
N.T.S



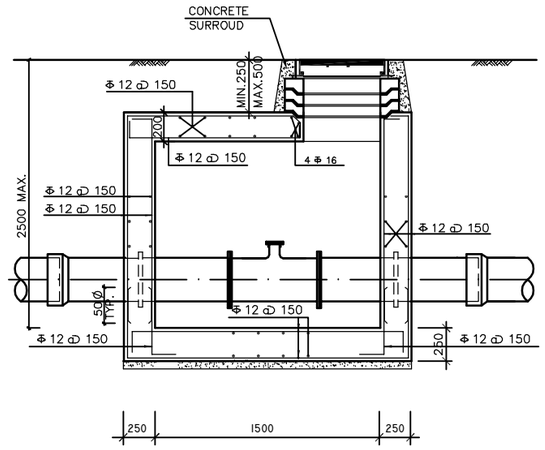
نموذج دعم الصمام

TYPICAL VALVE SUPPORT

SECTION A-A

نموذج غرفة صمامات هواء رقم (١) على خطوط الطرد للاقطار اقل من ٣٠٠ مم

TYPE 1 AIR VALVE CHAMBER DETAILS FOR DIAMETERS < 300MM



SECTION A-A

تفاصيل تسليح غرفة صمامات الهواء نموذج رقم (١)

REINFORCEMENT DETAILS FOR TYPE 1 AIR VALVE CHAMBER

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO MANHOLE WALLS, OR VALVE CHAMBER AND / OR END OF CONCRETE ENCASEMENT PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
   –FOR D < 450mm, X = 2 PIPE DIAMETERS.
   –FOR 450 < D < 800mm, X = 1.20m.
DESIGN IS BASED ON NO GROUND WATER TABLE.

١ - يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران الصابق وغرف الصمامات او عند نهاية التغليف الخرساني
توضع الوصلة الأولى على مسافة لاتزيد عن قطر الأنبوب
وتوضع الاخرى على مسافة لاتزيد عن مايلي :
- ضعف قطر الأنبوب للأقطار أقل من ٤٥٠ مم .
- ١،٢٠ متر للأقطار أكبر من ٤٥٠ مم وحتى ٨٠٠ مم .

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

SEWAGE AIR VALVE CHAMBER TYPE (1) ON FORCE MAINS Ø ⩽ 300mm

اسم الخريطة :

نموذج غرفة صمامات هواء رقم (١) على خطوط الطرد للاقطار اقل او يساوي ٣٠٠مم

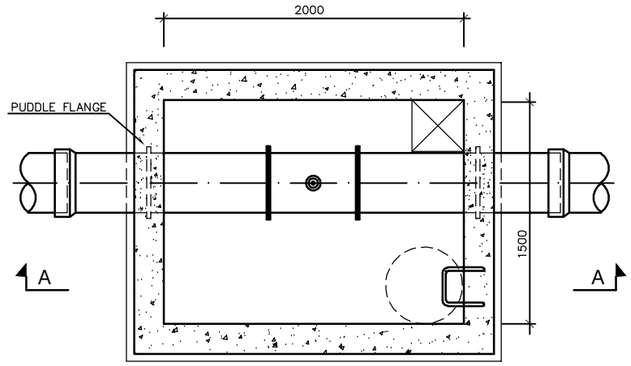
Project No: S19158

Drawing No: 18

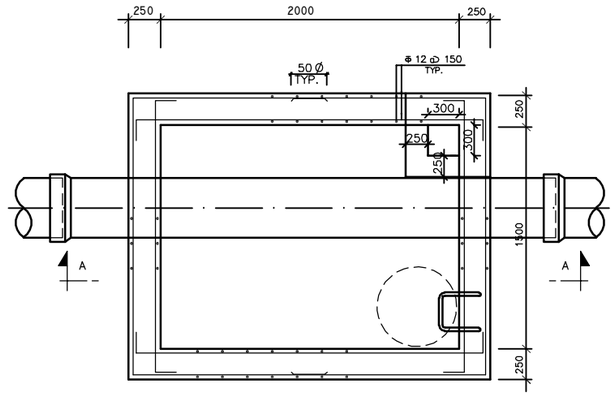
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

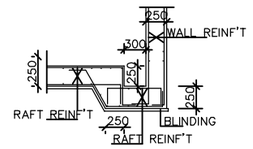
DIA. OF SEWAGE FORCE MAIN (MM)	AIR VALVE SIZE (mm)
LESS THAN 300 mm.	40
300 – 600 mm.	60
700 – 900 mm.	100
1000 – 1200 mm.	150



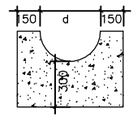
PLAN



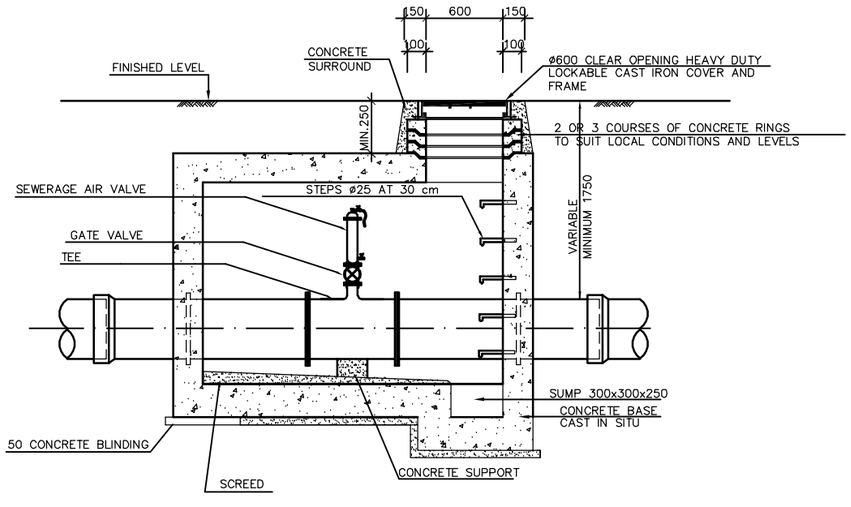
PLAN



SUMP PIT SECTION
N.T.S



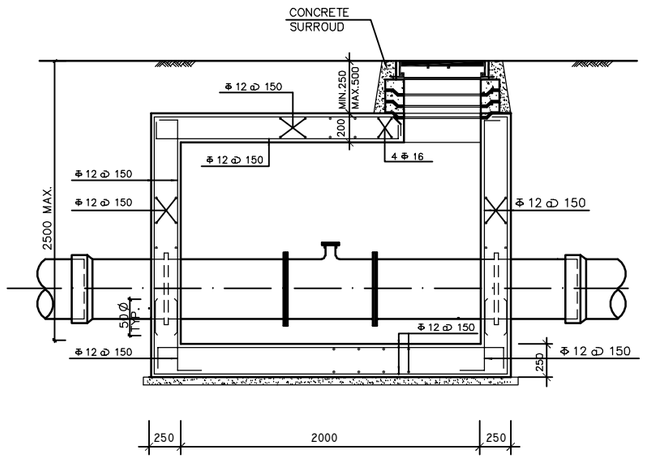
نموذج دعم الصمام
TYPICAL VALVE SUPPORT



SECTION A-A

نموذج غرفة صمامات الهواء رقم (٢) على خطوط الطرد للاقطار من ٤٠٠ - ٦٠٠ مم

TYPE 2 AIR VALVE CHAMBER DETAILS FOR DIAMETERS FROM 400 TO 600MM



SECTION A-A

تفاصيل تسليح نموذج غرفة صمامات الهواء رقم (٢)

REINFORCEMENT DETAILS FOR TYPE 2 AIR VALVE CHAMBER

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO MANHOLE WALLS, OR VALVE CHAMBER AND / OR END OF CONCRETE ENCASEMENT PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
   –FOR D < 450mm, X = 2 PIPE DIAMETERS.
   –FOR 450 ⩽ D ⩽ 800mm, X = 1.20m.
DESIGN IS BASED ON NO GROUND WATER TABLE.

١ - يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران المطابق وغرف الممامات او عند نهاية التغليف الخرساني توضع الوصلة الأولى على مسافة لاتزيد عن قطر الانبوب وتوضع الاخرى على مسافة لاتزيد عن ماياتى .
- ضعف قطر الأنبوب للأقطار أقل من ٤٥٠ مم .
- ١,٢٠ متر للأقطار من ٤٥٠ مم وحتى ٨٠٠ مم .

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

SEWAGE AIR VALVE CHAMBER TYPE (2) ON FORCE MAINS
400 ⩽ Ø ⩽ 600mm

اسم الخريطة :

نموذج غرفة صمامات الهواء رقم (٢)
على خطوط الطرد للاقطار
من ٤٠٠ – ٦٠٠ مم

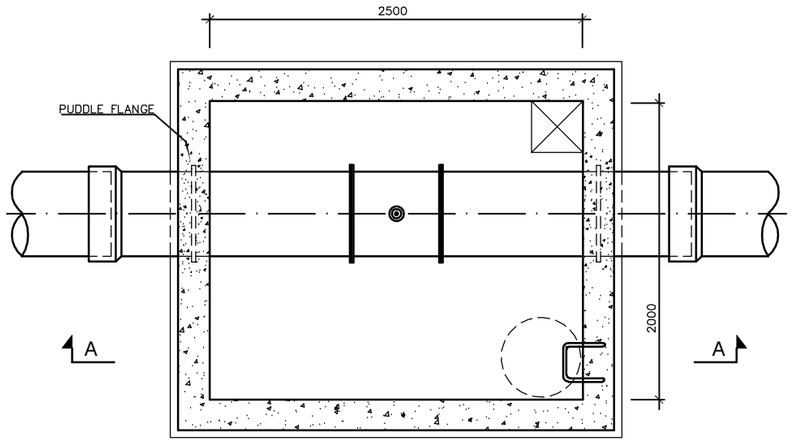
Project No: S19158

Drawing No: 19

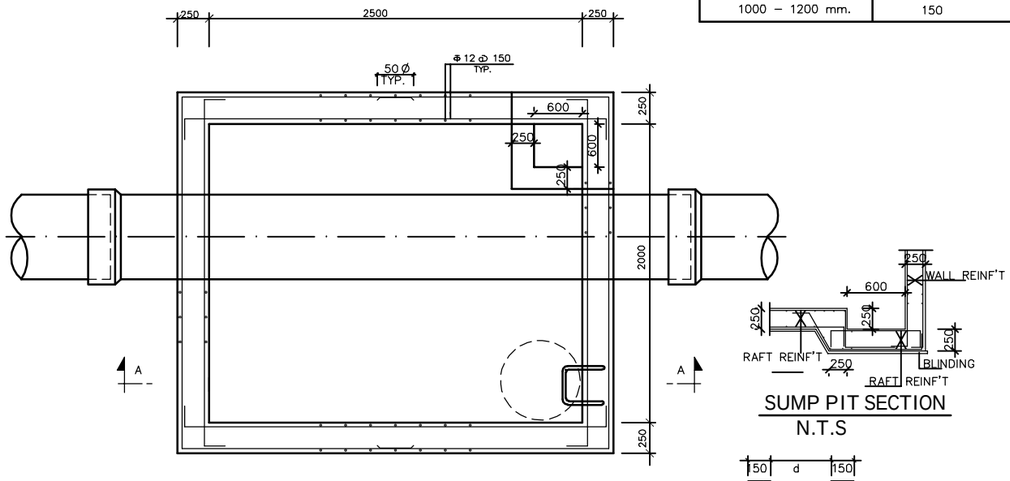
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

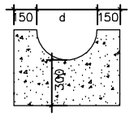
DIA. OF SEWAGE FORCE MAIN (MM)	AIR VALVE SIZE (mm)
LESS THAN 300 mm.	40
300 – 600 mm.	60
700 – 900 mm.	100
1000 – 1200 mm.	150



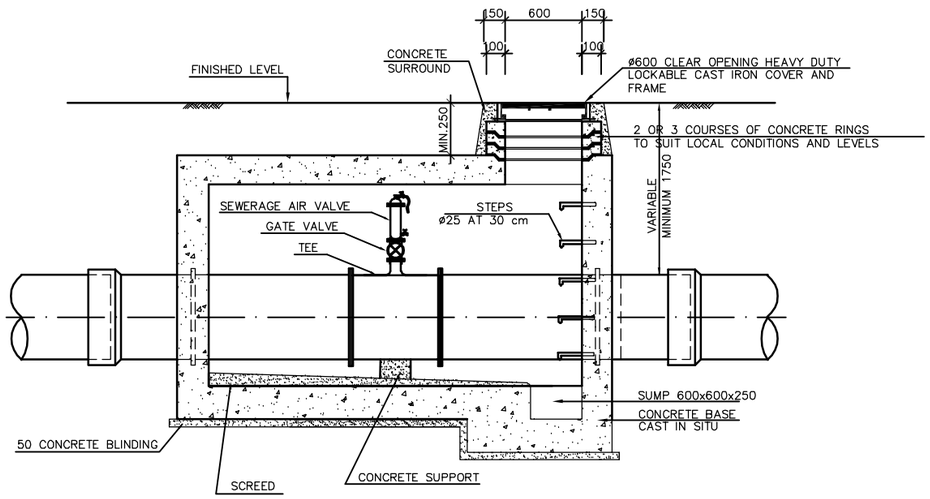
PLAN



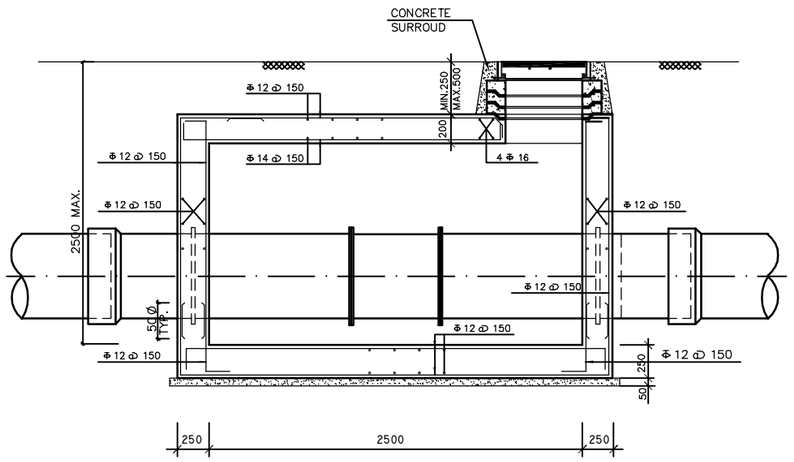
SUMP PIT SECTION
N.T.S



نموذج دعم الصمام
TYPICAL VALVE SUPPORT



SECTION A-A



نموذج غرفة صمامات الهواء رقم (٣) على خطوط الطرد للاقطار من ٧٠٠ - ٩٠٠ مم
TYPE 3 AIR VALVE CHAMBER DETAILS FOR DIAMETERS FROM 700 TO 900MM

تفاصيل تسليح نموذج غرفة صمامات الهواء رقم (٣)
REINFORCEMENT DETAILS FOR TYPE 3 AIR VALVE CHAMBER

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO MANHOLE WALLS, OR VALVE CHAMBER AND / OR END OF CONCRETE ENCASEMENT PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
   - FOR D < 450mm, X = 2 PIPE DIAMETERS.
   - FOR 450 ⩽ D ⩽ 800mm, X = 1.20m.
DESIGN IS BASED ON NO GROUND WATER TABLE.

١- يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران الطابق وهرف الصمامات او عند نهاية التغليف الخرساني
توضع الوصلة الأولى على مسافة لاتزيد عن قطر الانبوب
وتوضع الاخرى على مسافة لاتزيد عن مايلي -
- ضعف قطر الأنبوب للأقطار أقل من ٤٥٠ مم -
- ١,٢٠ متر للأقطار من ٤٥٠ مم وحتى ٨٠٠ مم -

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

SEWAGE AIR VALVE CHAMBER TYPE (3) ON FORCE MAINS
700 ⩽ Ø ⩽ 900mm

اسم الخريطة :

نموذج غرفة صمامات الهواء رقم (٣)
على خطوط الطرد للاقطار
من ٧٠٠ – ٩٠٠ مم

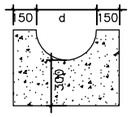
Project No: S19158

Drawing No: 20

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

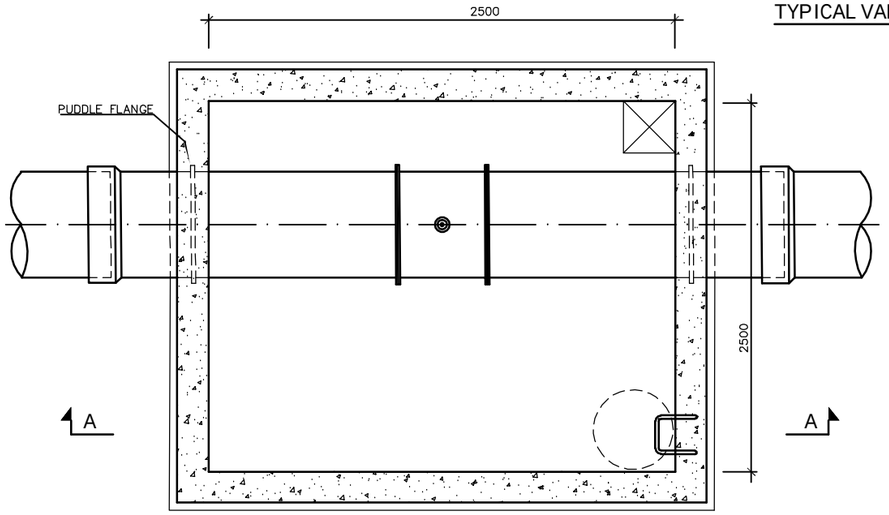
NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

DIA. OF SEWAGE FORCE MAIN (MM)	AIR VALVE SIZE (mm)
LESS THAN 300 mm.	40
300 – 600 mm.	60
700 – 900 mm.	100
1000 – 1200 mm.	150

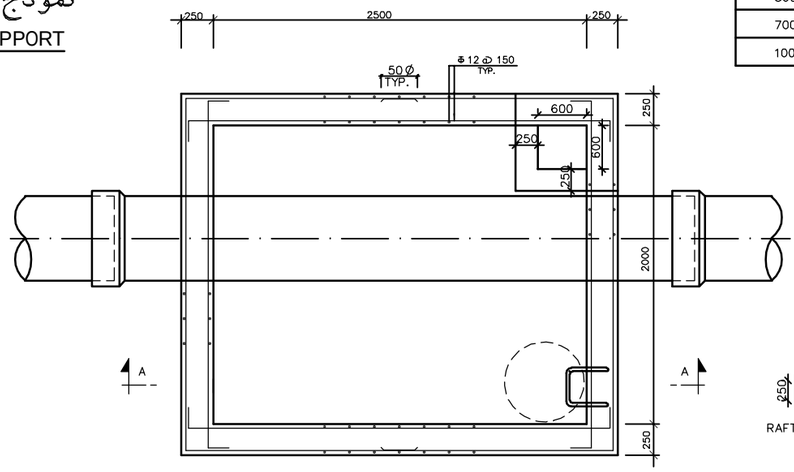


نموذج دعم الصمام

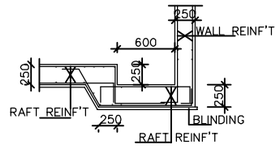
TYPICAL VALVE SUPPORT



PLAN

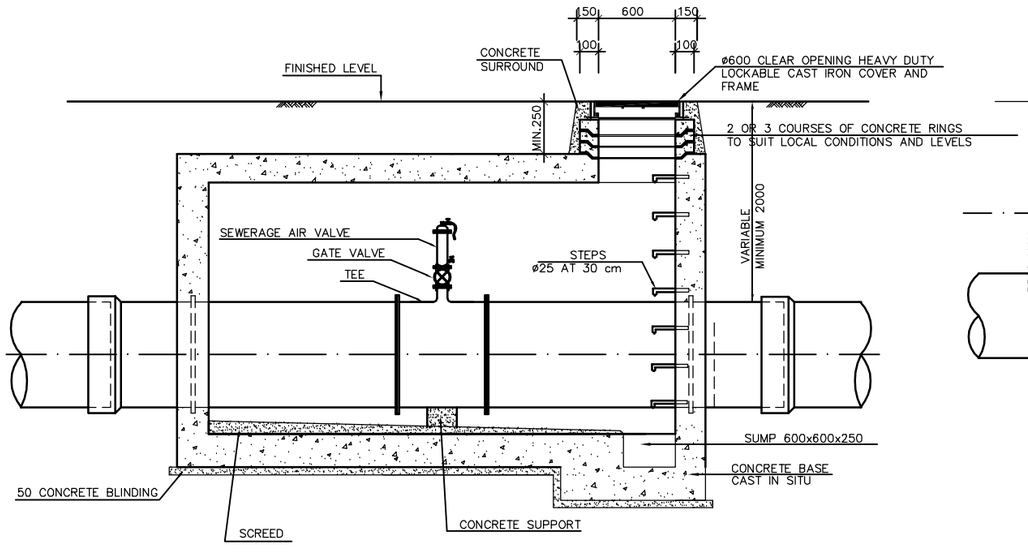


PLAN

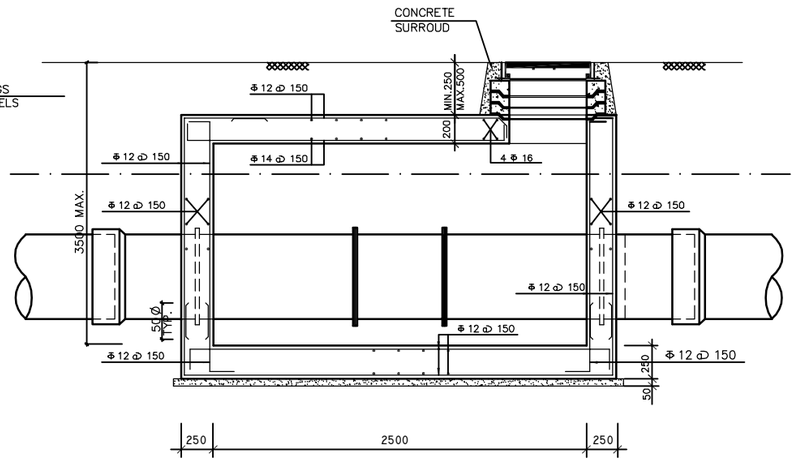


SUMP PIT SECTION

N.T.S



SECTION A-A



SECTION A-A

نموذج غرفة صمامات الهواء رقم (٤) على خطوط الطرد للاقطار من ١٠٠٠ - ١٢٠٠مم

TYPE 4 AIR VALVE CHAMBER DETAILS FOR DIAMETERS FROM 1000 TO 1200MM

تفاصيل تسليح نموذج غرفة صمامات الهواء رقم (٤)

REINFORCEMENT DETAILS FOR TYPE 4 AIR VALVE CHAMBER

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO MANHOLE WALLS, OR VALVE CHAMBER AND / OR END OF CONCRETE ENCASEMENT PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
   -FOR D < 450mm, X = 2 PIPE DIAMETERS.
   -FOR 450 ≤ D ≤ 800mm, X = 1.20m.
DESIGN IS BASED ON NO GROUND WATER TABLE.

١ - يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران الطابق وغرف الصمامات او عند نهاية التغليف الخرساني توضع الوصلة الأولى على مسافة لاتزيد عن قطر الانبوب وتوضع الاخرى على مسافة لاتزيد عن مايلي .
- ضعف قطر الأنبوب للأقطار أقل من ٤٥٠ مم .
- ١,٢٠ متر للأقطار من ٤٥٠ مم وحتى ٨٠٠ مم .

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

SEWAGE AIR VALVE CHAMBER TYPE (4) ON FORCE MAINS
1000 ≤ Ø ≤ 1200mm

اسم الخريطة :

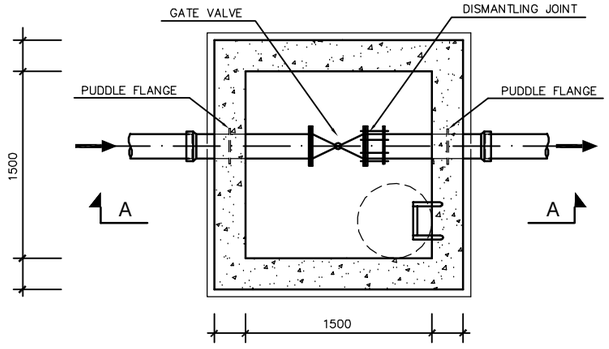
نموذج غرفة صمامات الهواء رقم (٤)
على خطوط الطرد للاقطار
من ١٠٠٠-١٢٠٠مم

Project No: S19158

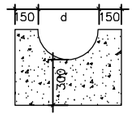
Drawing No: 21

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

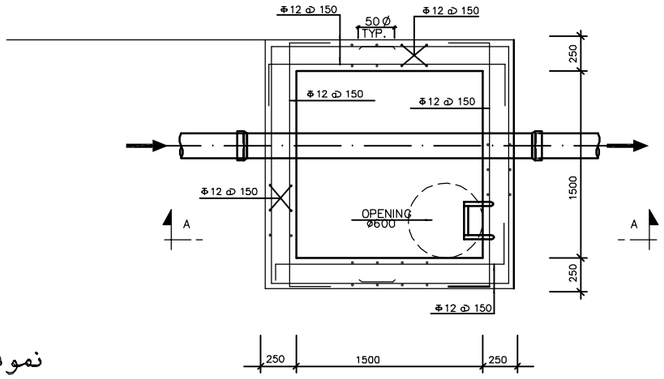


PLAN

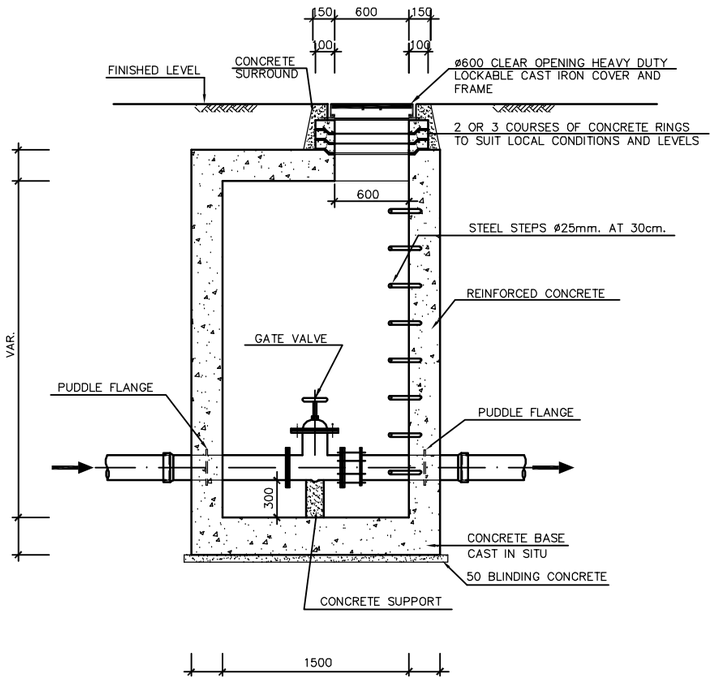


نموذج دعم الصمام

TYPICAL VALVE SUPPORT



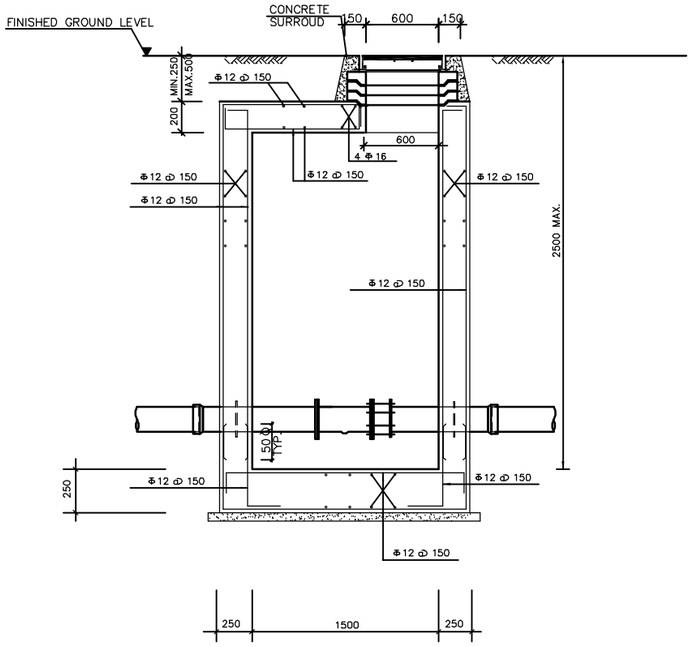
PLAN
N.T.S.



SECTION A-A

نموذج غرفة صمامات قفل بوابى رقم (١) لخطوط الطرد بقطر اقل من ٣٠٠ مم

TYPE 1 GATE VALVE CHAMBER FOR FORCE MAIN DIAMETERS < 300MM



SECTION A-A
N.T.S.

تتفاصيل تسليح نموذج غرفة صمامات قفل بوابى رقم (١)

REINFORCEMENT DETAILS FOR TYPE 1 GATE VALVE CHAMBER

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO MANHOLE WALLS, OR VALVE CHAMBER AND / OR END OF CONCRETE ENCASEMENT PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
-FOR D < 450mm, X = 2 PIPE DIAMETERS.
-FOR 450 ≤ D ≤ 800mm, X = 1.20m.

DESIGN IS BASED ON NO GROUND WATER TABLE.

١ - يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران المطابق وغرف الصمامات او عند نهاية التغليف الخرساني توضع الوصلة الاولى على مسافة لاتزيد عن قطر الانبوب وتوضع الاخرى على مسافة لاتزيد عن مايلى .
- ضعف قطر الأنبوب للأقطار أقل من ٤٥٠ مم .
- ١,٢٠ متر للأقطار من ٤٥٠ مم وحتى ٨٠٠ مم .

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:
VALVE CHAMBER DETAILS FOR GATE VALVE TYPE (1) ON FORCE MAINS Ø < 300mm

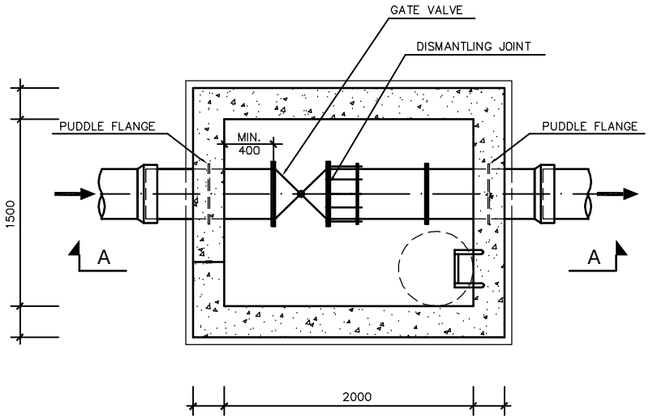
اسم الخريطة :
نموذج غرفة صمامات قفل بوابي رقم (١) لخطوط الطرد بقطر اقل من ٣٠٠مم

Project No: S19158

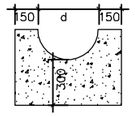
Drawing No: 22

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

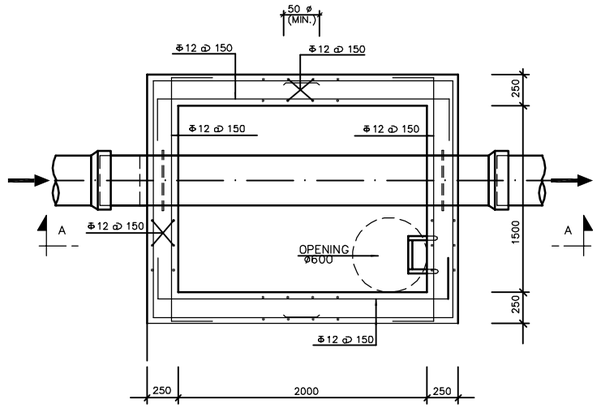


PLAN

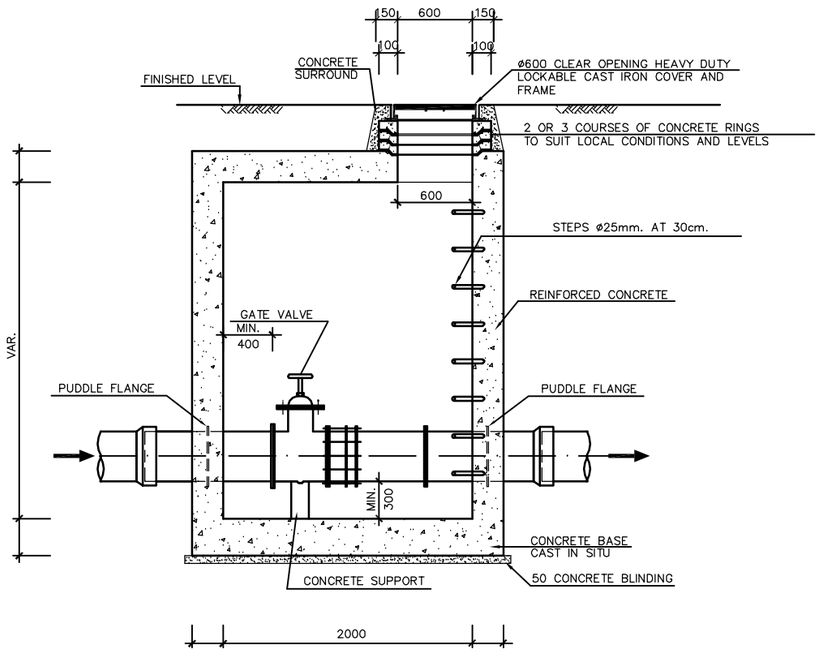


نموذج دعم الصمام

TYPICAL VALVE SUPPORT



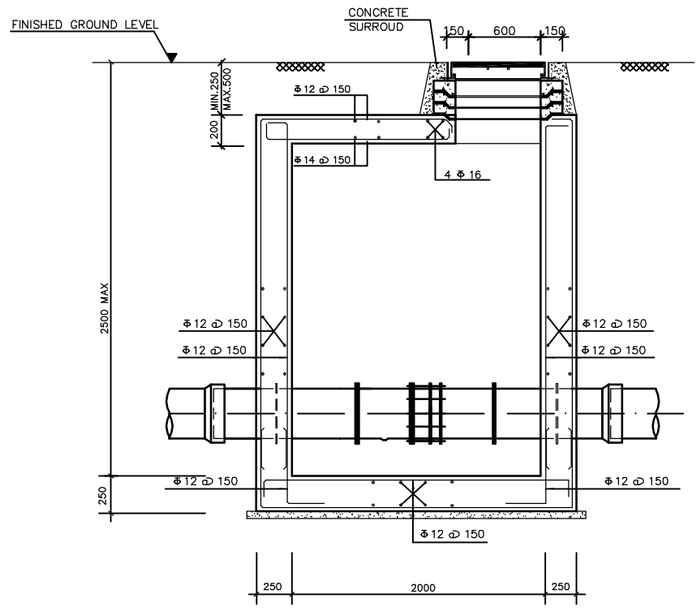
PLAN
N.T.S.



SECTION A-A

نموذج غرفة صمامات قفل بوابى رقم (٢) لخطوط الطرد باقطار من ٣٠٠ - ٤٠٠ مم

TYPE 2 GATE VALVE CHAMBER FOR FORCE MAIN DIAMETERS FROM 300 TO 400MM



SECTION A-A
N.T.S.

تفاصيل تسليح نموذج غرفة صمامات قفل بوابى رقم (٢)

REINFORCEMENT DETAILS FOR TYPE 2 GATE VALVE CHAMBER

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO MANHOLE WALLS, OR VALVE CHAMBER AND / OR END OF CONCRETE ENCASEMENT PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
   -FOR D < 450mm, X = 2 PIPE DIAMETERS.
   -FOR 450 ⩽ D ⩽ 800mm, X = 1.20m.
DESIGN IS BASED ON NO GROUND WATER TABLE.

١ - يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران المطابق وهرف الصمامات او عند نهاية التطليف الخرساني
توضع الوصلة الأولى على مسافة لاتزيد عن قطر الانبوب
وتوضع الاخرى على مسافة لاتزيد عن مايلى .
- ضعف قطر الأنبوب للأقطار أقل من ٤٥٠ مم .
-١,٢٠ متر للأقطار من ٤٥٠ مم وحتى ٨٠٠ مم .

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

VALVE CHAMBER DETAILS
FOR GATE VALVE TYPE (2)
ON FORCE MAINS
300 ⩽ Ø ⩽ 400mm

اسم الخريطة :

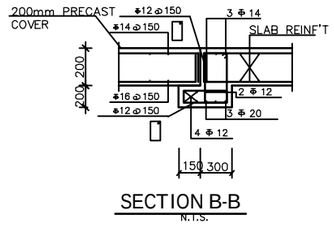
نموذج غرفة صمامات قفل بوابى
رقم (٢) لخطوط الطرد باقطار
من ٣٠٠-٤٠٠مم

Project No: S19158

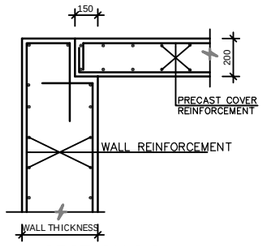
Drawing No: 23

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

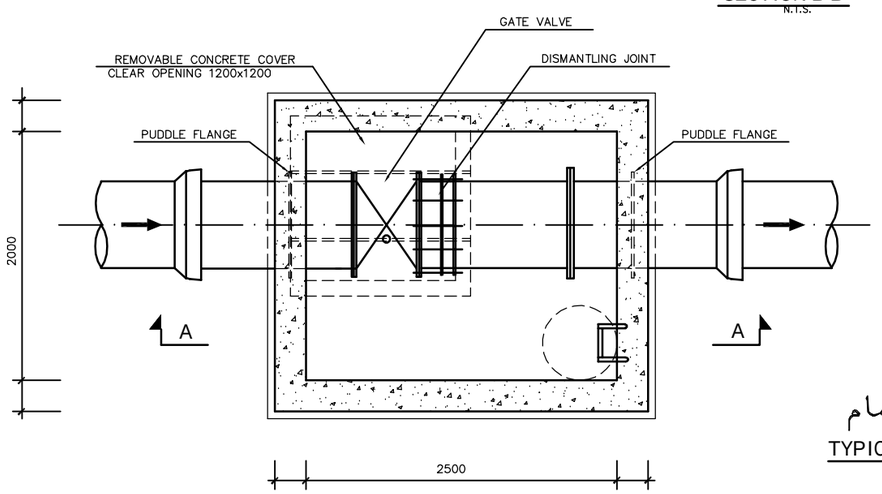
NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.



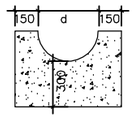
SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

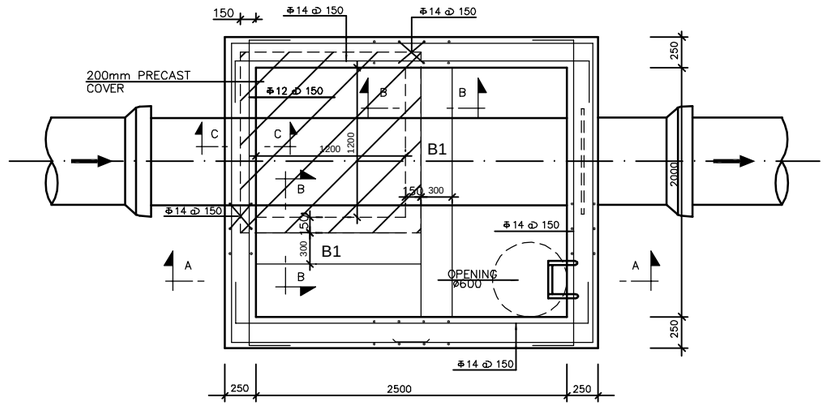


PLAN

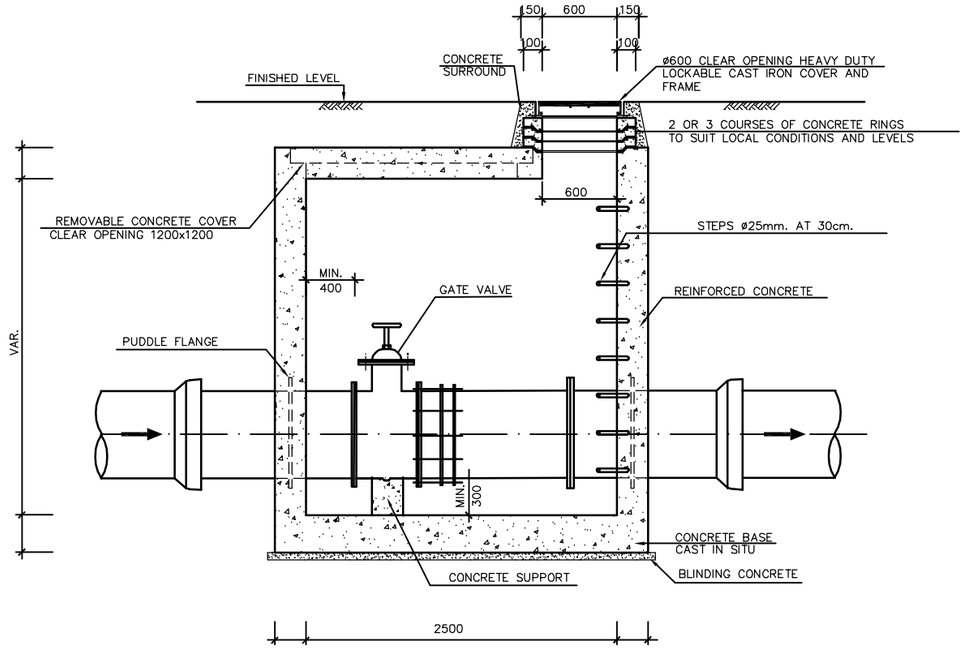


نموذج دعم الصمام

TYPICAL VALVE SUPPORT



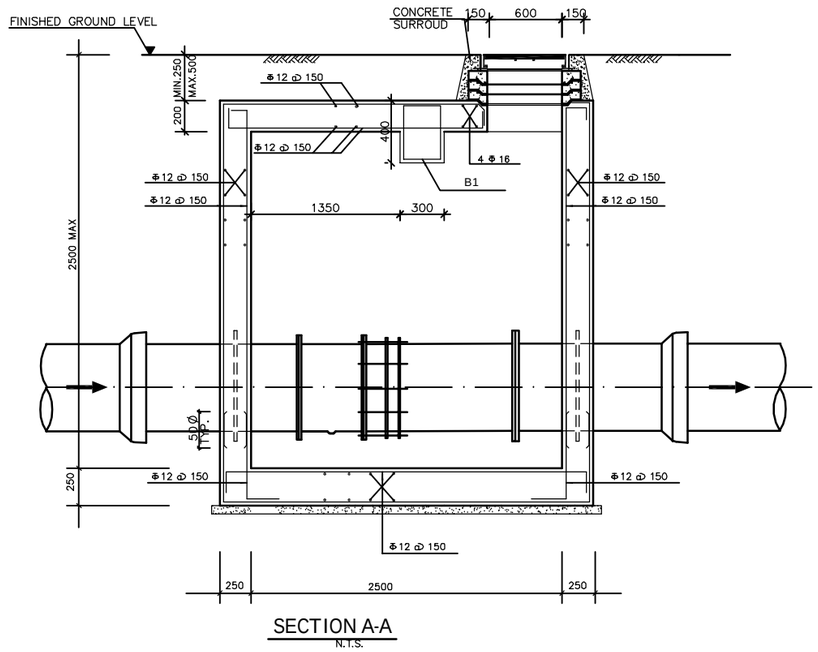
PLAN
N.T.S.



SECTION A-A

نموذج غرفة صمامات قفل بوابى رقم (٣) لخطوط الطرد باقطار من ٥٠٠ - ٨٠٠ مم

TYPE 3 GATE VALVE CHAMBER FOR FORCE MAIN DIAMETERS FROM 500 TO 800MM



SECTION A-A
N.T.S.

تفاصيل تسليح نموذج غرفة صمامات قفل بوابى رقم (٣)

REINFORCEMENT DETAILS FOR TYPE 3 GATE VALVE CHAMBER

nwc المياه الوطنية

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO MANHOLE WALLS, OR VALVE CHAMBER AND / OR END OF CONCRETE ENCASEMENT PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THAN THE FOLLOWING.
   -FOR D < 450mm, X = 2 PIPE DIAMETERS.
   -FOR 450 ⩽ D ⩽ 800mm, X = 1.20m.

DESIGN IS BASED ON NO GROUND WATER TABLE.

١- يتم توريد وتركيب عدد (٢) وصلة مرنة مجاورة لجدران المطابق وغرف الصمامات او عند نهاية التغليف الخرساني
توضع الوصلة الأولى على مسافة لاتزيد عن قطر الأنبوب وتوضع الاخرى على مسافة لاتزيد عن مايلى :
- ضعف قطر الأنبوب للأقطار أقل من ٤٥٠ مم .
-١,٢٠ متر للأقطار من ٤٥٠ مم وحتى ٨٠٠ مم .

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

VALVE CHAMBER DETAILS
FOR GATE VALVE TYPE (3)
ON FORCE MAINS
500 ⩽ Ø ⩽ 800mm

اسم الخريطة :

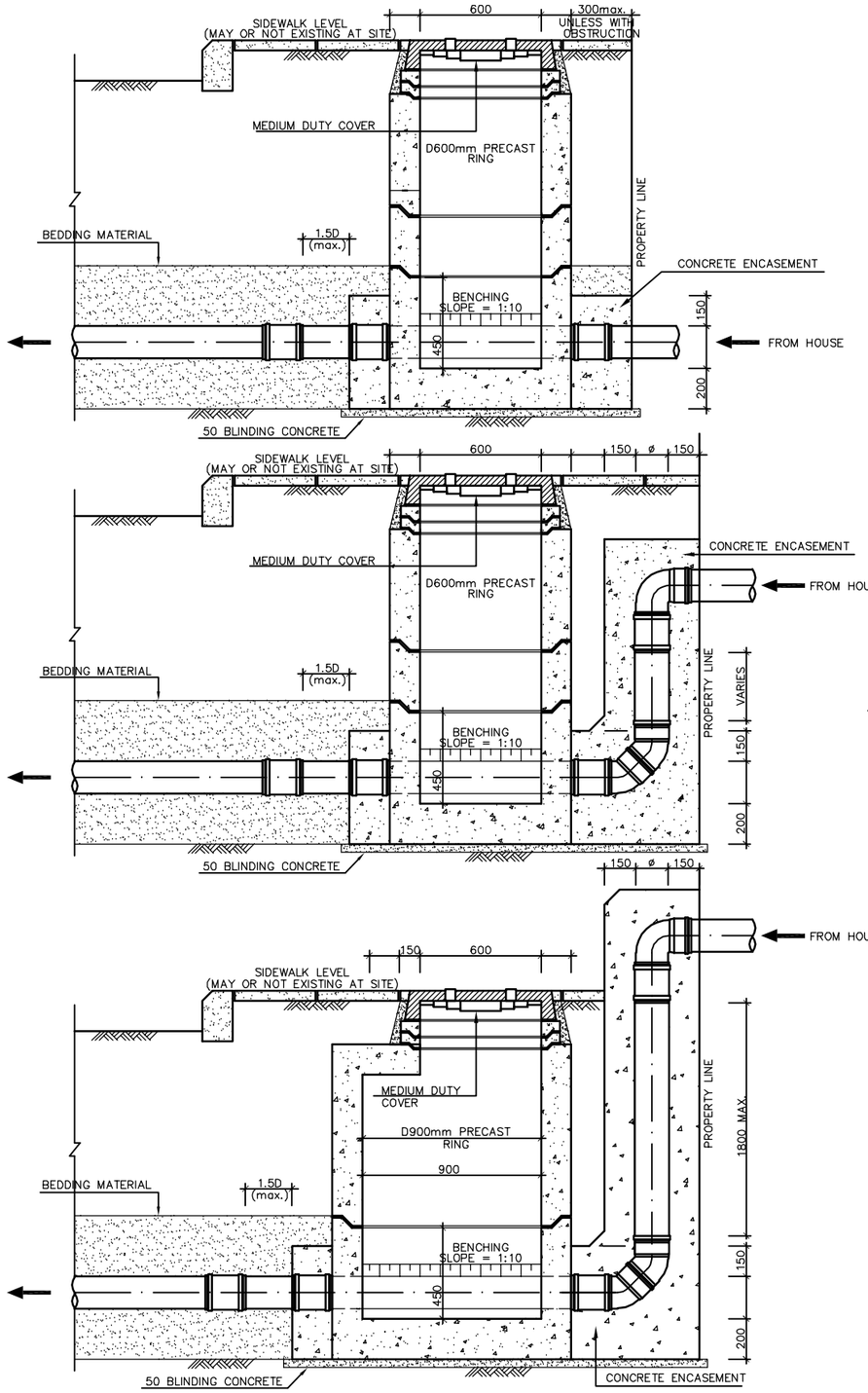
نموذج غرفة صمامات قفل بوابى
رقم (٣) لخطوط الطرد باقطار
من ٥٠٠ - ٨٠٠مم

Project No: S19158

Drawing No: 24

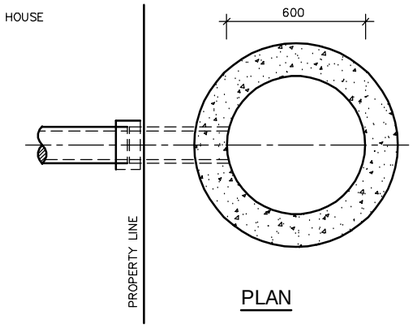
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

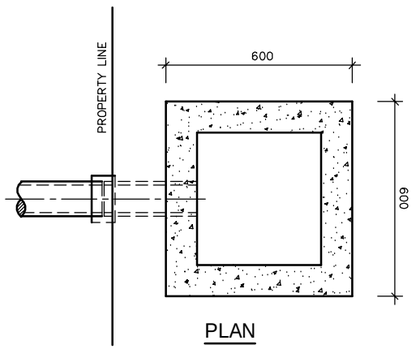


تفاصيل غرف التفتيش على الوصلات المنزلية

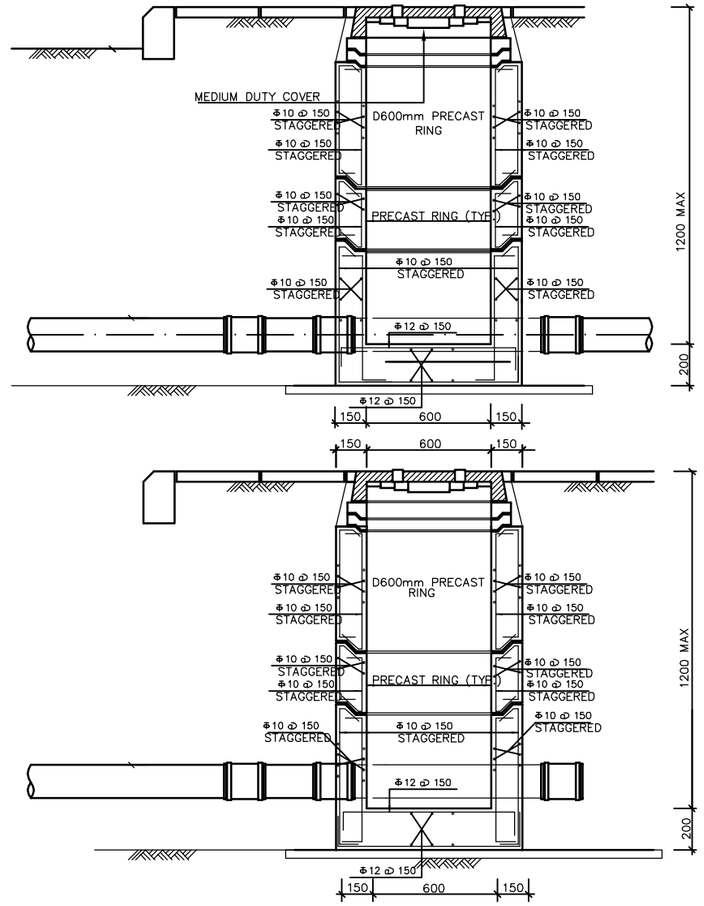
TYPICAL INSPECTION CHAMBER CONNECTION

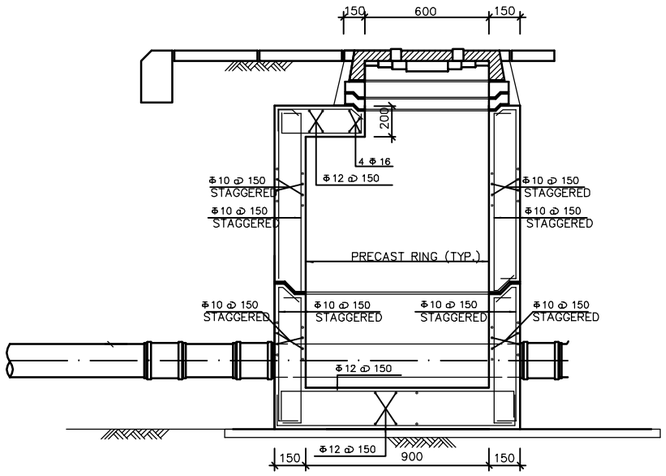


PLAN



PLAN





تفاصيل تسليح غرف التفتيش على الوصلات المنزلية

REINFORCEMENT DETAILS FOR TYPICAL INSPECTION CHAMBER CONNECTION

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

1- FOR INSPECTION CHAMBER DEEPER THAN 1.5 METERS USE 90cm DIAMETER CHAMBERS AND ADD STEPS.

2- ALL CHAMBER ARE CIRCULAR USE Ø600 UP TO 1.5M DEEP AND Ø900 FOR CHAMBER DEEPER THAN 1.5M.

3- DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

INSPECTION CHAMBER AT SERVICE CONNECTION

اسم الخريطة :

نموذج لغرفة التفتيش على الوصلات المنزلية

Project No: S19158

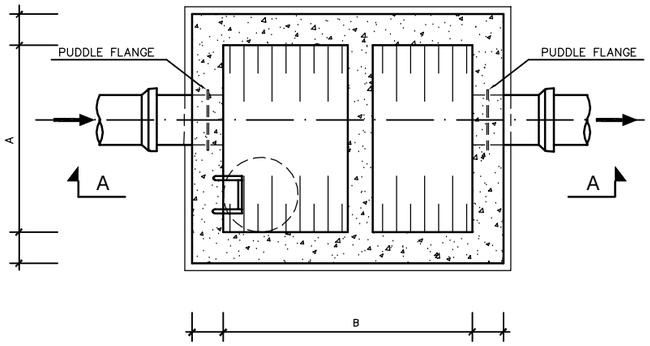
Drawing No: 25

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

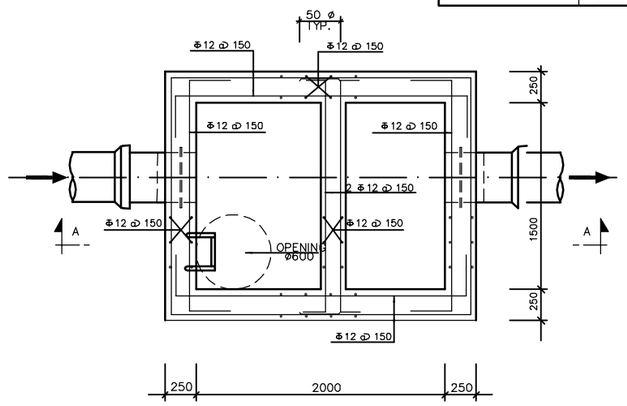
NOTE: DESIGN IS BASED ON NO GROUND WATER TABLE.

DISCHARGE CHAMBER SIZE

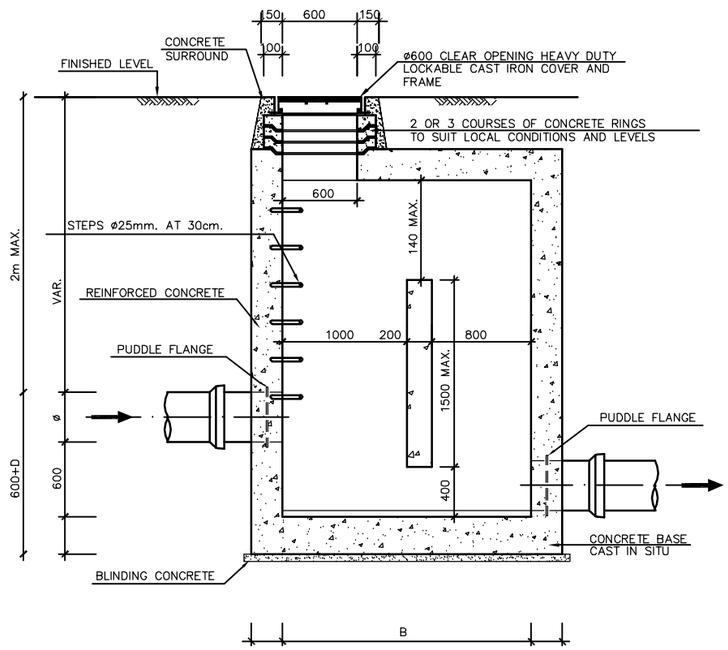
DIAMETER OF PIPE	A	B	DEPTH
200 – 600 mm.	1500 mm.	2000 mm.	2500 mm.
600 – 1200 mm.	2000 mm.	2500 mm.	3000 mm.



PLAN



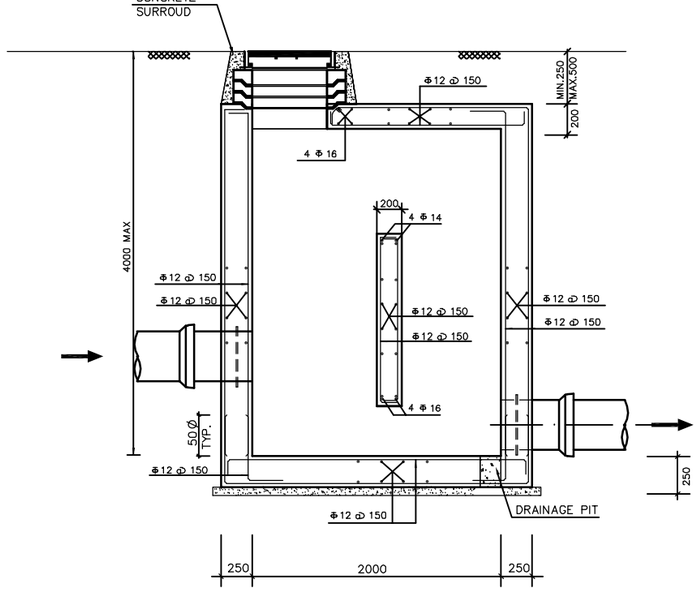
PLAN
N.T.S.



SECTION A-A

غرف التصريف لخطوط الطرد

DISCHARGE CHAMBER



SECTION A-A
N.T.S.

تفاصيل تسليح غرف التصريف لخطوط الطرد

REINFORCEMENT DETAILS FOR DISCHARGE CHAMBER

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

DISCHARGE CHAMBER

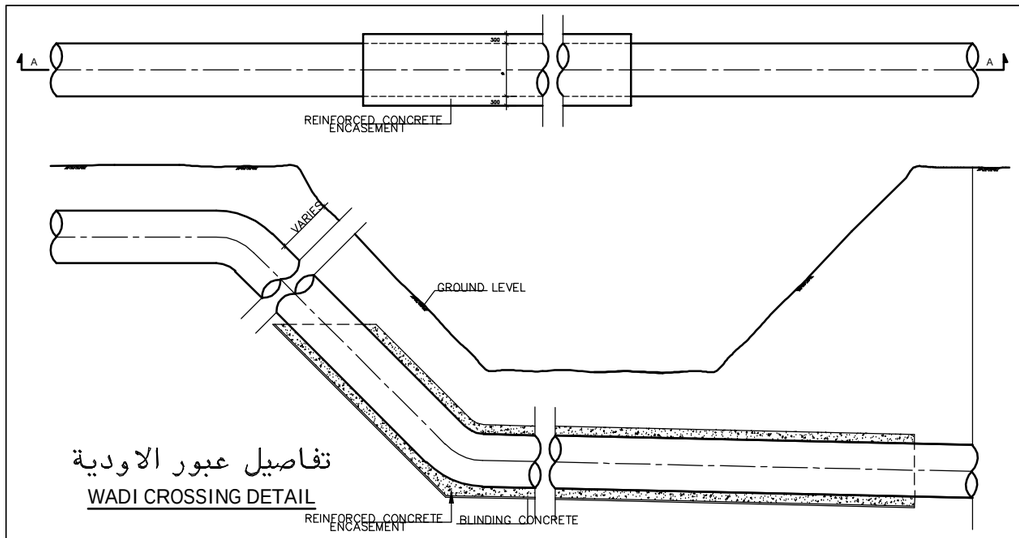
اسم الخريطة :

غرف التصريف لخطوط الطرد

Project No: S19158

Drawing No: 26

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020



تفاصيل عبور الاودية
WADI CROSSING DETAIL

THRUST BLOCK FOR HORIZONTAL BENDS — P WORKING = 13 KG/CM2 — P TEST = 19.50 KG/CM2

PIPE DIAM.	11.25° BEND				22.5° BEND				45° BEND				TEE				BLANK FLANGE			
M.M	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM
80	450	650	280	100	450	650	280	100	750	500	200	100	1000	500	200	100	1200	600	200	200
100	490	690	300	100	600	500	200	100	890	650	250	150	1090	700	300	100	1590	750	250	250
150	570	770	330	100	900	600	250	100	1600	750	250	250	1470	1050	450	150	1270	1590	620	350
200	700	700	300	100	1400	750	300	150	1500	1320	510	300	1350	1890	850	200	1400	2450	1000	450
250	850	800	350	100	1550	900	350	200	1370	1900	780	350	1520	2230	990	250	1670	2850	1150	550
300	1200	800	350	100	1400	1350	550	250	1750	2160	850	450	1700	2800	1250	300	1750	3750	1550	650
350	870	1330	620	100	1670	1480	620	250	1770	2700	1100	500	1670	3550	1600	350	1770	4650	1950	750
400	950	1530	690	150	1150	2450	1070	300	1800	3300	1350	600	1750	4300	1950	400	1800	5650	2400	850
450	1020	1680	760	150	1320	2730	1190	350	1570	4250	1800	650	1820	4850	2200	450	1820	6450	2750	950
500	1100	1870	840	200	1400	3020	1310	400	1800	4550	1900	750	1800	5800	2650	500	1800	7650	3300	1050
600	1960	1650	700	250	1860	3250	1400	450	1960	5700	2400	900	1960	7200	3300	600	1960	9350	4050	1250
700	2010	2050	900	250	1910	3950	1700	550	2010	6900	2950	1000	2010	8500	3900	700	2010	11250	4900	1450
800	1970	2600	1150	300	2070	4700	2050	600	2120	8050	3450	1150	2070	10100	4650	800	2120	12950	5650	1650
900	2030	3050	1350	350	2130	5400	2350	700	2180	9200	3950	1300	2130	11650	5350	950	2180	14900	6500	1900
1000	2280	3200	1400	400	2180	6000	2600	800	2270	10250	4400	1450	2280	12650	5850	1050	2270	16400	7150	2100
1200	2290	4150	1850	450	2390	7250	3150	950	2440	12450	5350	1750	2390	15450	7100	1250	2440	19700	8600	2500
1500	2660	5200	2300	600	2660	9200	4000	1200	2660	15600	6700	2200	2660	18900	8700	1550	2660	24500	10700	3100

THRUST BLOCK FOR HORIZONTAL BENDS — P WORKING = 9 KG/CM2 — P TEST = 13.5 KG/CM2

PIPE DIAM.	11.25° BEND				22.5° BEND				45° BEND				TEE				BLANK FLANGE			
M.M	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM	H MM	A MM	B MM	C MM
80	450	650	300	100	450	600	250	100	400	500	200	100	500	500	200	100	500	500	200	100
100	500	700	300	100	500	600	250	100	550	550	200	150	900	500	200	100	900	500	200	100
150	600	700	300	100	500	600	250	100	800	750	250	250	1300	650	250	150	1300	650	250	150
200	650	700	300	100	700	750	300	150	1000	1000	350	300	1450	1000	400	200	1450	1000	400	200
250	750	700	300	100	750	900	350	200	1250	1150	400	350	1450	1350	550	250	1450	1350	550	250
300	800	700	300	100	950	1100	350	250	1750	1250	400	450	1500	1800	750	300	1500	1800	750	300
350	1000	700	300	100	950	1500	650	250	1750	1600	550	500	1550	2200	950	350	1550	2200	950	350
400	1100	800	350	150	950	1700	700	300	1750	2000	700	600	1750	2550	1070	400	1750	2550	1070	400
450	1250	850	350	150	1050	1900	800	350	1750	2350	850	650	1350	3650	1600	450	1350	3650	1600	450
500	1350	950	400	200	1100	2100	850	400	1850	2650	950	750	1400	4100	1800	500	1400	4100	1800	500
600	1350	1400	600	250	1700	2100	900	450	2000	3400	1250	900	1800	4600	2000	600	1800	4600	2000	600
700	1350	1650	700	250	1750	2550	1000	550	2000	4300	1650	1000	2000	5400	2400	700	2000	5400	2400	700
800	1500	1800	750	300	2000	2800	1150	600	2150	4950	1900	1150	2000	6500	2850	800	2000	6500	2850	800
900	1650	2050	850	350	2150	3200	1250	700	2150	5800	2250	1300	2150	7650	3350	950	2150	7650	3350	950
1000	1800	2200	900	400	2300	3600	1400	800	2250	6450	2500	1450	2300	8250	3600	1050	2300	8250	3600	1050
1200	2300	2950	1250	450	2300	5450	2250	950	2450	9350	3800	1750	2400	11750	5250	1250	2400	11750	5250	1250
1500	2660	3600	1500	600	2700	6800	2800	1200	2700	11700	4750	2200	2700	14350	6400	1550	2700	14350	6400	1550

تفاصيل كتل التثبيت الخرسانية للأكواع الأفقية
THRUST BLOCKS FOR HORIZONTAL BENDS

PIPE CLASS 18(P.TEST=13KG/CM2, P.WORKING=9KG/CM2.

DN (MM)	A1 (CM)	A2 (CM)	B1 (CM)	B2 (CM)	H (CM)	STRAP (S) NO.xB(MM)xT(MM)	STRAP (FOOT) LxBxT1(MM)xT(MM)	BOLTS
100	20	70	45	75		1 x 100 x 8	48 x 100 x 8	2M12
150	20	75	45	80	55	1 x 100 x 8	48 x 100 x 8	2M12
200	20	75	50	95	55	1 x 100 x 8	48 x 100 x 8	2M12
250	20	100	55	110	80	1 x 100 x 8	48 x 100 x 8	2M12
300	20	100	60	125	80	1 x 100 x 8	48 x 100 x 10	2M12
350	20	125	65	135	105	1 x 100 x 10	48 x 100 x 12	2M12
400	20	125	70	150	105	1 x 100 x 10	48 x 100 x 14	2M12
450	20	125	75	160	105	1 x 100 x 10	56 x 100 x 16	2M16
500	20	150	80	175	130	1 x 100 x 10	64 x 100 x 18	2M16
600	20	150	90	195	130	1 x 100 x 10	80 x 100 x 24	2M20
700	20	175	100	220	155	2 x 100 x 12	64 x 100 x 18	2M16
800	21	176	110	240	155	2 x 100 x 12	72 x 100 x 22	4M20
900	23	203	120	250	180	2 x 100 x 12	80 x 100 x 26	4M20
1000	26	215	135	270	190	2 x 100 x 12	100 x 120 x 37	4M30
1200	30	240	155	310	215	2 x 100 x 12	96 x 100 x 34	6M24

THRUST ANCHORS FOR 22.5° VERTICAL BEND.
PIPE CLASS 13(P.TEST=18KG/CM2, P.WORKING=13.5KG/CM2.

DN (MM)	A1 (CM)	A2 (CM)	B1 (CM)	B2 (CM)	H (CM)	STRAP (S) NO.xB(MM)xT(MM)	STRAP (FOOT) LxBxT1(MM)xT(MM)	BOLTS
100	20	75	45	100	55	1 x 100 x 8	48 x 100 x 8	2M12
150	20	80	45	105	60	1 x 100 x 8	48 x 100 x 8	2M12
200	20	95	50	125	75	1 x 100 x 8	48 x 100 x 10	2M12
250	20	110	55	145	90	1 x 100 x 8	48 x 100 x 12	2M12
300	20	120	60	160	100	1 x 100 x 8	56 x 100 x 14	2M14
350	20	135	65	180	115	1 x 100 x 10	64 x 100 x 16	2M16
400	21	146	70	195	125	1 x 100 x 10	72 x 100 x 22	2M18
450	23	156	75	210	135	1 x 100 x 10	80 x 100 x 26	2M20
500	25	170	80	225	145	1 x 100 x 10	88 x 100 x 30	2M22
600	28	188	90	250	160	2 x 100 x 10	80 x 100 x 24	4M20
700	32	212	100	280	180	2 x 100 x 12	88 x 100 x 30	4M22
800	36	231	110	305	195	2 x 100 x 12	104 x 100 x 38	4M26
900	40	250	120	330	210	3 x 100 x 12	96 x 100 x 34	6M24
1000	46	280	135	380	250	3 x 100 x 12	100 x 120 x 36	6M36
1200	55	330	155	435	300	3 x 100 x 12	100x 120 x 36	6M36

THRUST ANCHORS FOR 11.25° VERTICAL BEND.
PIPE CLASS 12(P.TEST=9KG/CM2, P.WORKING=6KG/CM2.

DN (MM)	A1 (CM)	A2 (CM)	B1 (CM)	B2 (CM)	H (CM)	STRAP (S) NO.xB(MM)xT(MM)	STRAP (FOOT) LxBxT1(MM)xT(MM)	BOLTS
100	20	50	45	75	30	1 x 100 x 8	48 x 100 x 8	2M12
150	20	55	45	80	35	1 x 100 x 8	48 x 100 x 8	2M12
200	20	65	50	95	45	1 x 100 x 8	48 x 100 x 8	2M12
250	20	75	55	110	55	1 x 100 x 8	48 x 100 x 8	2M12
300	20	85	60	125	65	1 x 100 x 8	48 x 100 x 8	2M12
350	20	90	65	135	70	1 x 100 x 10	48 x 100 x 10	2M12
400	20	100	70	150	80	1 x 100 x 10	48 x 100 x 10	2M12
450	20	105	75	160	85	1 x 100 x 10	48 x 100 x 14	2M12
500	20	115	80	175	95	1 x 100 x 10	56 x 100 x 14	2M16
600	20	125	90	195	105	1 x 100 x 10	64 x 100 x 16	2M16
700	20	140	100	220	120	2 x 100 x 12	48 x 100 x 14	4M12
800	21	151	110	240	130	2 x 100 x 12	58 x 100 x 16	4M16
900	23	163	120	250	140	2 x 100 x 12	64 x 100 x 20	4M16
1000	23	175	175	260	155	2 x 100 x 12	96 x 100 x 24	4M24
1200	25	200	135	280	175	2 x 100 x 12	100 x 120 x 37	4M30

THRUST ANCHORS FOR 45° VERTICAL BEND.
PIPE CLASS 18(P.TEST=13KG/CM2, P.WORKING=9KG/CM2.

DN (MM)	A1 (CM)	A2 (CM)	B1 (CM)	B2 (CM)	H (CM)	STRAP (S) NO.xB(MM)xT(MM)	STRAP (FOOT) LxBxT1(MM)xT(MM)	BOLTS
100	20	115	45	140	95	1 x 100 x 8	60 x 100 x 10	2M12
150	20	145	50	170	125	1 x 100 x 8	60 x 100 x 13	2M12
200	25	175	55	205	150	1 x 100 x 8	64 x 100 x 19	2M16
250	30	195	60	225	170	1 x 100 x 8	80 x 100 x 22	2M20
300	35	220	65	250	190	1 x 100 x 8	96 x 100 x 31	2M24
350	35	240	70	275	205	1 x 100 x 8	120 x 100 x 37	2M30
400	40	265	75	300	225	2 x 100 x 8	80 x 100 x 25	4M20
450	45	285	80	320	240	2 x 100 x 8	96 x 100 x 31	4M24
500	50	305	85	340	260	2 x 100 x 8	120 x 100 x 37	4M30
600	55	345	95	385	290	3 x 100 x 10	96 x 100 x 34	6M24
700	65	380	105	425	320	1 x 100 x 8	64 x 100 x 18	2M12
800	70	415	115	460	345	Contractor to provide design based on thrust force = 60T for engineer's approval		
900	80	450	125	500	375	Contractor to provide design based on thrust force = 75T for engineer's approval		
1000	90	485	135	535	400	Contractor to provide design based on thrust force = 90T for engineer's approval		
1200	105	545	160	600	445	Contractor to provide design based on thrust force = 130T for engineer's approval		

THRUST ANCHORS FOR 45° VERTICAL BEND.
PIPE CLASS 12(P.TEST=9KG/CM2, P.WORKING=6KG/CM2.

DN (MM)	A1 (CM)	A2 (CM)	B1 (CM)	B2 (CM)	H (CM)	STRAP (S) NO.xB(MM)xT(MM)	STRAP (FOOT) LxBxT1(MM)xT(MM)	BOLTS
100	20	105	45	125	85	1 x 100 x 8	60 x 100 x 10	2M12
150	20	125	50	155	105	1 x 100 x 8	60 x 100 x 13	2M12
200	25	155	55	185	130	1 x 100 x 8	64 x 100 x 16	2M16
250	30	170	60	205	145	1 x 100 x 8	64x 100 x 19	2M16
300	35	200	65	225	165	1 x 100 x 8	80 x 100 x 22	2M20
350	35	215	70	250	180	1 x 100 x 8	96 x 100 x 28	2M24
400	40	235	75	270	195	1 x 100 x 8	96 x 100 x 34	2M24
450	45	250	80	285	210	1 x 100 x 8	120 x 100 x 40	2M30
500	50	270	85	305	225	2 x 100 x 8	96 x 100 x 28	4M24
600	55	305	95	345	250	2 x 100 x 8	120 x 100 x 37	4M30
700	65	340	105	380	275	3 x 100 x 10	96 x 100 x 31	6M24
800	70	370	115	415	300	3 x 100 x 12	120 x 100 x 40	6M30
900	80	400	130	450	325	Contractor to provide design based on thrust force = 50T for engineer's approval		
1000	90	430	135	480	345	Contractor to provide design based on thrust force = 60T for engineer's approval		
1200	105	485	160	540	385	Contractor to provide design based on thrust force = 90T for engineer's approval		

THRUST ANCHORS FOR 22.5° VERTICAL BEND.
PIPE CLASS 12(P.TEST=9KG/CM2, P.WORKING=6KG/CM2.

DN (MM)	A1 (CM)	A2 (CM)	B1 (CM)	B2 (CM)	H (CM)	STRAP (S) NO.xB(MM)xT(MM)	STRAP (FOOT) LxBxT1(MM)xT(MM)	BOLTS
100	20	65	45	90	45	1 x 100 x 8	48 x 100 x 8	2M12
150	20	70	45	95	50	1 x 100 x 8	48 x 100 x 8	2M12
200	20	85	50	115	65	1 x 100 x 8	48 x 100 x 8	2M12
250	20	95	55	130	80	1 x 100 x 8	48 x 100 x 10	2M12
300	20	105	60	145	85	1 x 100 x 8	48 x 100 x 12	2M12
350	20	155	65	160	95	1 x 100 x 10	48 x 100 x 14	2M12
400	20	126	70	175	105	1 x 100 x 10	56 x 100 x 16	2M14
450	23	138	75	190	115	1 x 100 x 10	64 x 100 x 20	2M16
500	25	150	80	205	125	1 x 100 x 10	72 x 100 x 22	2M18
600	28	168	90	230	140	1 x 100 x 10	88 x 100 x 30	2M22
700	32	182	100	250	150	2 x 100 x 12	72 x 100 x 22	4M18
800	36	201	110	275	165	2 x 100 x 12	80 x 100 x 30	4M24
900	40	220	120	300	170	2 x 100 x 12	96 x 100 x 34	4M24
1000	46	260	135	350	200	3 x 100 x 12	96 x 100 x 34	6M24
1200	55	300	155	400	240	4 x 100 x 12	96 x 100 x 34	4M30

تفاصيل كتل التثبيت الخرسانية للأكواع العامودية
THRUST BLOCKS FOR VERTICAL BENDS

nwc المياه الوطنية

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

DESIGN IS BASED ON NO GROUND WATER TABLE.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

WADI CROSSING DETAILS

THRUST BLOCK DIMENSIONS

اسم الخريطة :

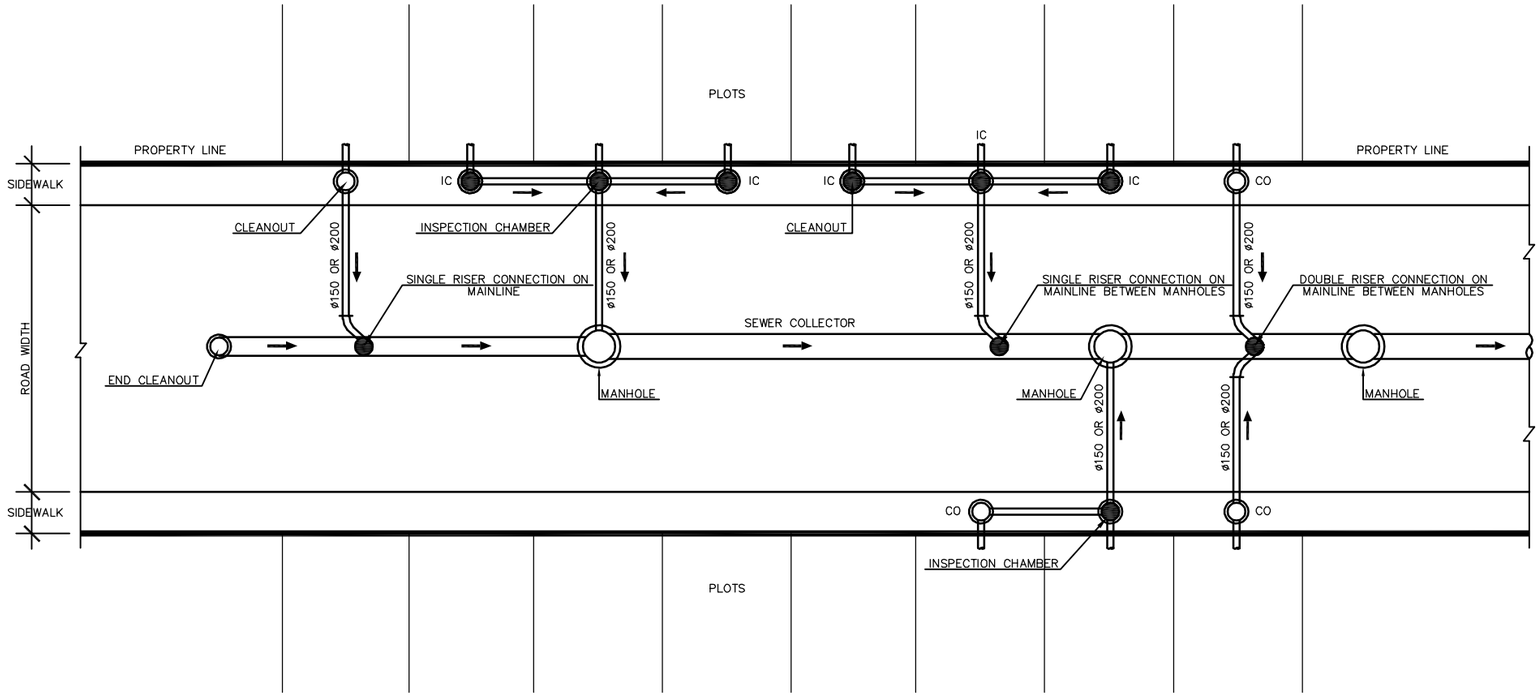
تفاصيل عبور الأودية

مقاسات كتل التثبيت الخرسانية

Project No: S19158

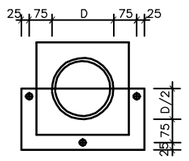
Drawing No: 27

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

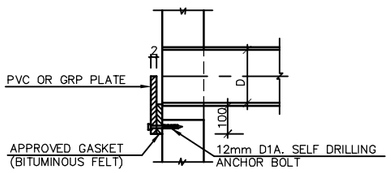


نموذج للتوصيلات المنزلية والمطابق

TYPICAL ARRANGEMENT OF HOUSE CONNECTIONS AND MANHOLES

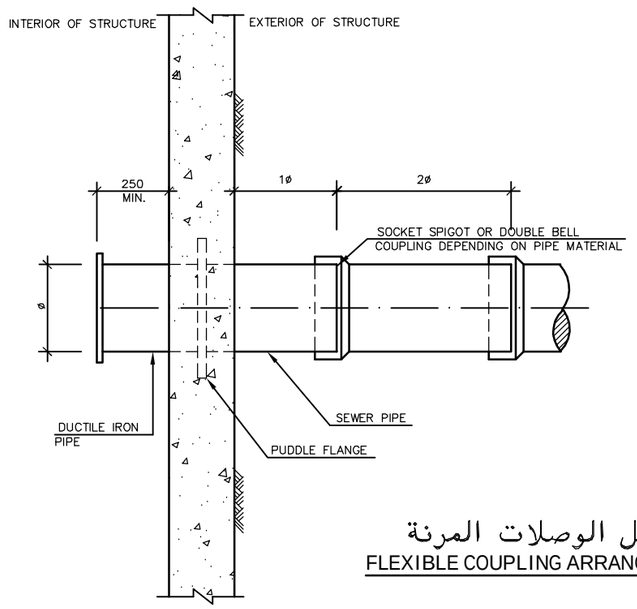


ELEVATION



SECTION

PIPE PLUG DETAIL



تفاصيل الوصلات المرنة

FLEXIBLE COUPLING ARRANGEMENT

NOTE:

1. PROVIDE TWO FLEXIBLE JOINTS ADJACENT TO WALLS. PLACE FIRST JOINT AT A DISTANCE NOT MORE THAN ONE DIAMETER. PLACE THE SECOND JOINT AT A DISTANCE (X) NOT MORE THE FOLLOWING.
   –FOR D < 450mm X = 2 PIPE DIAMETERS.
   –FOR 450 < D < 1000mm X = 1.20m.
2. PROVIDE PUDDLE FLANGE OR NON–SHRINK GROUT AROUND PIPE WITHIN THE STRUCTURE.

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

THE PIPE FROM INSPECTION CHAMBER AND FALLING INSIDE THE PROPERTY LINE SHALL BE OF SAME MATERIAL AS THAT USED BY OWNERS.

تكون الشبكيات من غرفة التفتيش الى ملكية المواطن من نفس النوع التي يستخدمها المواطن.

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

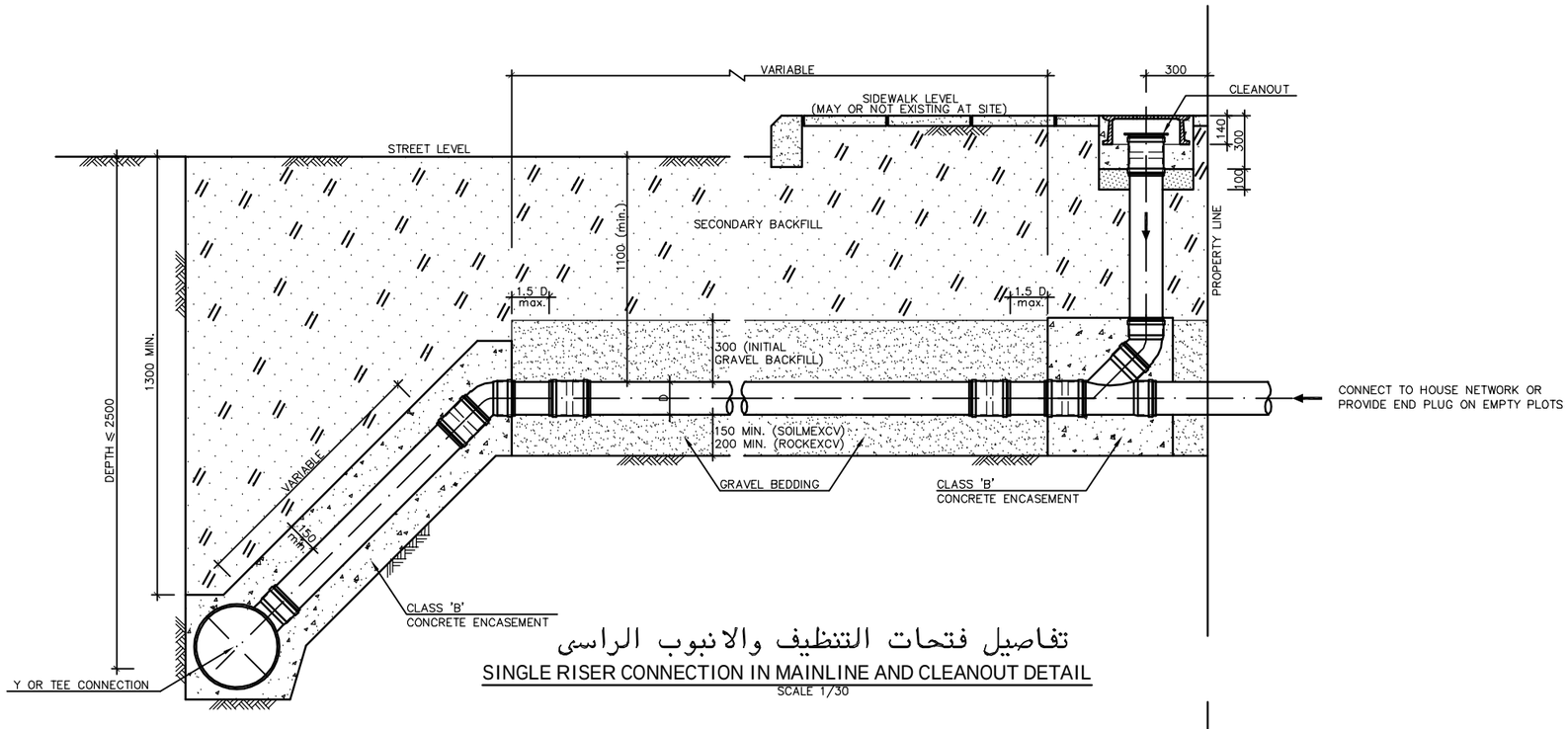
Drawing Name:
MISCELLANEOUS DETAILS

اسم الخريطة :
تفاصيل متفرقة

Project No: S19158

Drawing No: 28

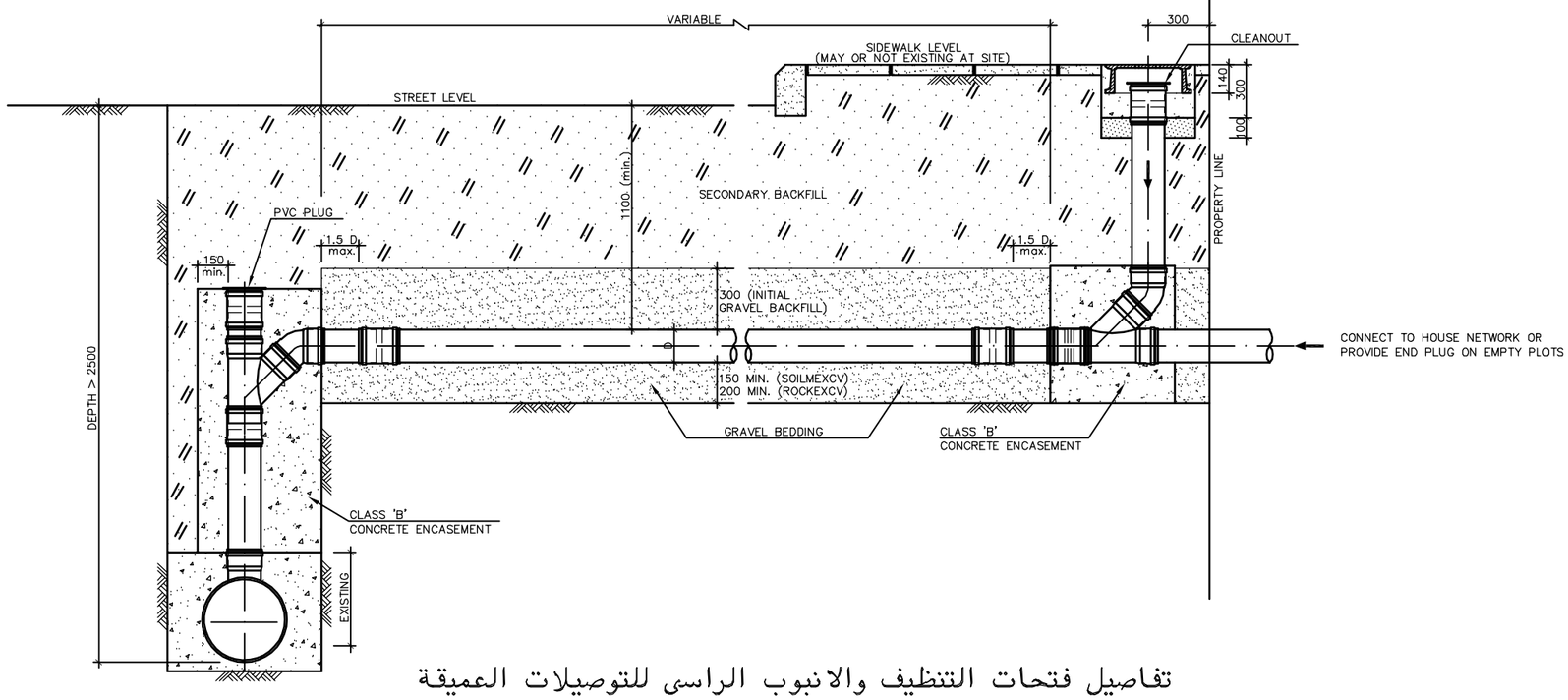
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020



تفاصيل فتحات التنظيف والانبوب الراسى

SINGLE RISER CONNECTION IN MAINLINE AND CLEANOUT DETAIL

SCALE 1/30



تفاصيل فتحات التنظيف والانبوب الراسى للتوصيلات العميقة

SINGLE RISER CONNECTION IN MAINLINE AND CLEANOUT DETAIL - DEEP CONNECTION DETAILS

SCALE 1/30

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

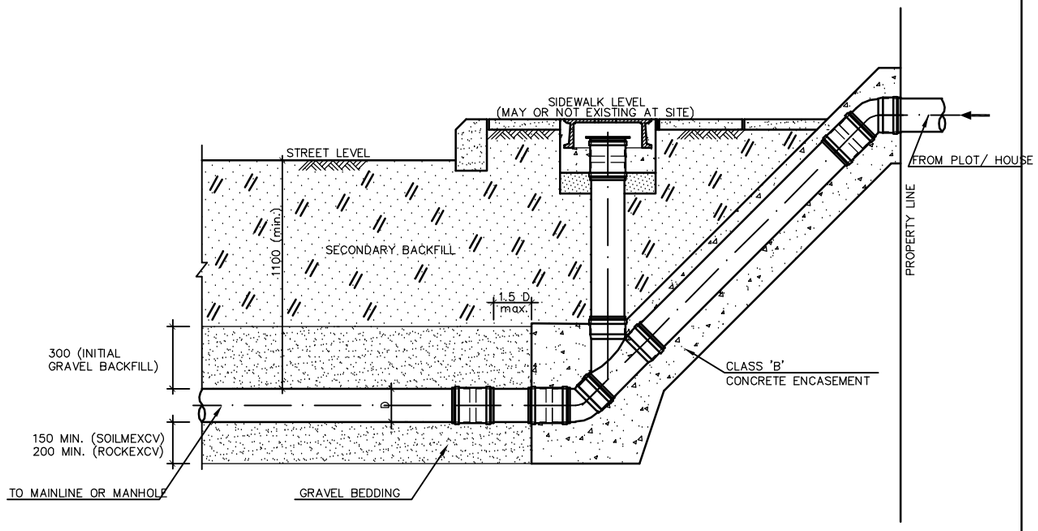
Drawing Name:
HOUSE CONNECTION DETAILS

اسم الخريطة :
تفاصيل التوصيلات المنزلية

Project No: S19158

Drawing No: 29

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

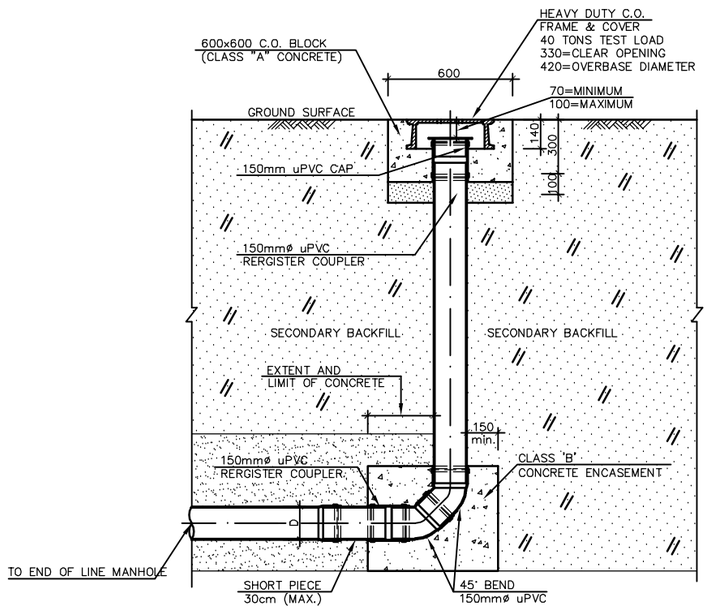


تفاصيل فتحات التنظيف عند التوصيلات

TYPICAL CLEANOUT (C.O.) CONNECTION ON PLOT DISCHARGE LINE

SCALE 1/30

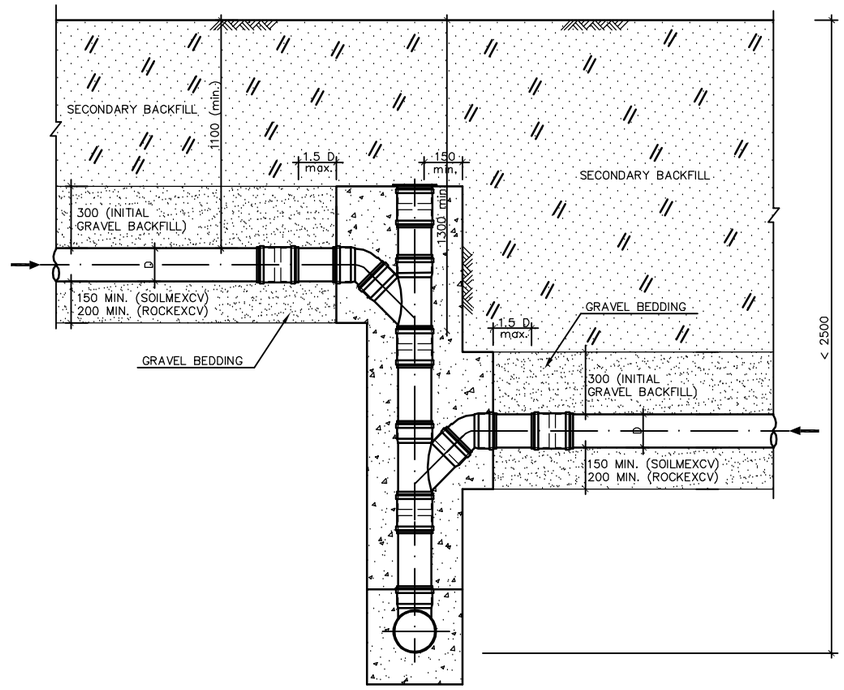
SINGLE RISER CONNECTION ON MAINLINE



تفاصيل فتحات التنظيف عند اخر الخط

END CLEANOUT ON MAINLINE

SCALE 1/30



تفاصيل الانابيب الراسية

TYPICAL MAINLINE RISERS DETAILS

SCALE 1/30

DOUBLE RISER CONNECTION ON MAINLINE BETWEEN MANHOLES

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

CLEANOUT AND MAINLINE RISERS

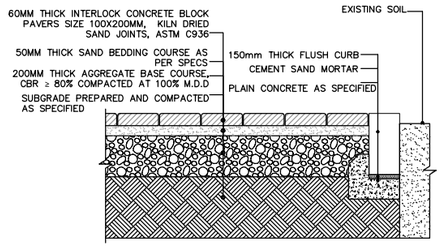
اسم الخريطة :

فتحات التنظيف والانابيب الرأسية

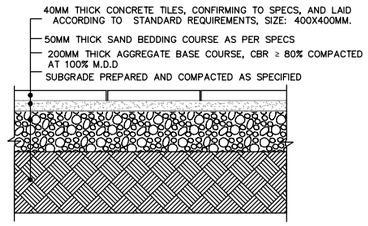
Project No: S19158

Drawing No: 30

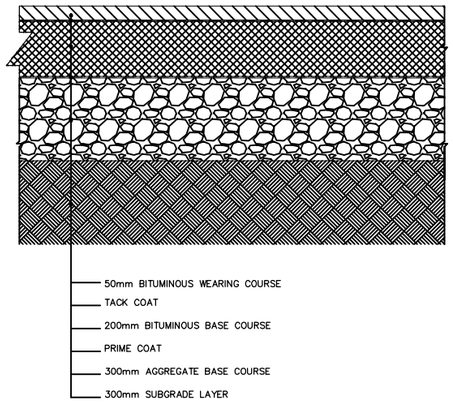
Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

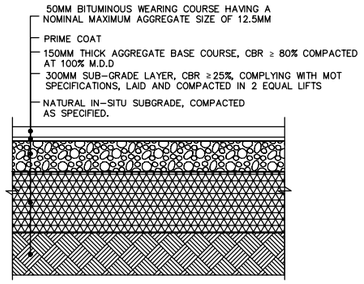

60MM THICK INTERLOCK CONCRETE BLOCK PAVERS SIZE 100X200MM, KILN DRIED SAND JOINTS, ASTM C936
50MM THICK SAND BEDDING COURSE AS PER SPECS
200MM THICK AGGREGATE BASE COURSE, CBR ≥ 80% COMPACTED AT 100% M.D.D
SUBGRADE PREPARED AND COMPACTED AS SPECIFIED
150mm THICK FLUSH CURB
CEMENT SAND MORTAR
PLAIN CONCRETE AS SPECIFIED
EXISTING SOIL

1 CONCRETE INTERLOCK PAVERS DETAIL(PEDESTRIAN)

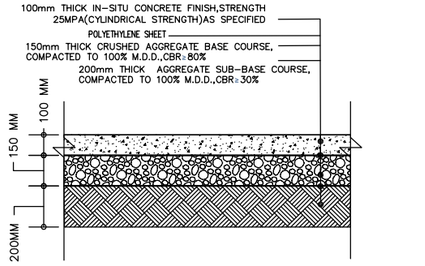

40MM THICK CONCRETE TILES, CONFIRMING TO SPECS, AND LAID ACCORDING TO STANDARD REQUIREMENTS, SIZE: 400X400MM.
50MM THICK SAND BEDDING COURSE AS PER SPECS
200MM THICK AGGREGATE BASE COURSE, CBR ≥ 80% COMPACTED AT 100% M.D.D
SUBGRADE PREPARED AND COMPACTED AS SPECIFIED

2 PRECAST CONCRETE TILES DETAIL (PEDESTRIAN)



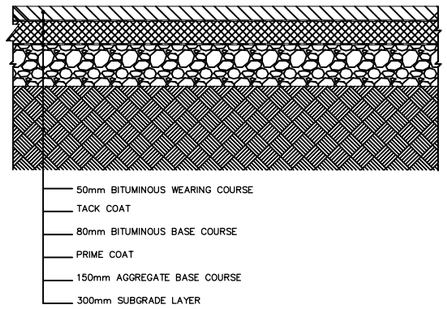

50MM BITUMINOUS WEARING COURSE HAVING A NOMINAL MAXIMUM AGGREGATE SIZE OF 12.5MM
PRIME COAT
150MM THICK AGGREGATE BASE COURSE, CBR ≥ 80% COMPACTED AT 100% M.D.D
300MM SUB-GRADE LAYER, CBR ≥25%, COMPLYING WITH MOT SPECIFICATIONS, LAID AND COMPACTED IN 2 EQUAL LIFTS
NATURAL IN-SITU SUBGRADE, COMPACTED AS SPECIFIED.

3 ASPHALT FINISH (CYCLE LANE)

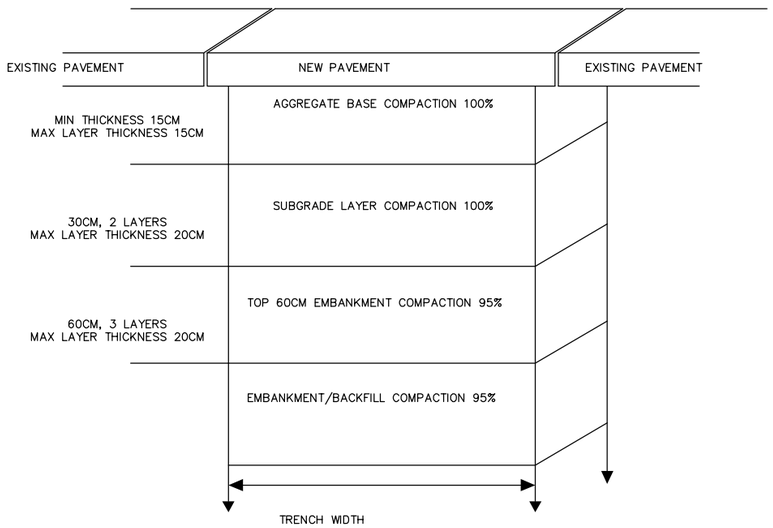

100mm THICK IN-SITU CONCRETE FINISH,STRENGTH 25MPA(CYLINDRICAL STRENGTH)AS SPECIFIED
POLYETHYLENE SHEET
150mm THICK CRUSHED AGGREGATE BASE COURSE, COMPACTED TO 100% M.D.D.,CBR≥80%
200mm THICK AGGREGATE SUB-BASE COURSE, COMPACTED TO 100% M.D.D.,CBR≥30%
100 MM
150 MM
200MM

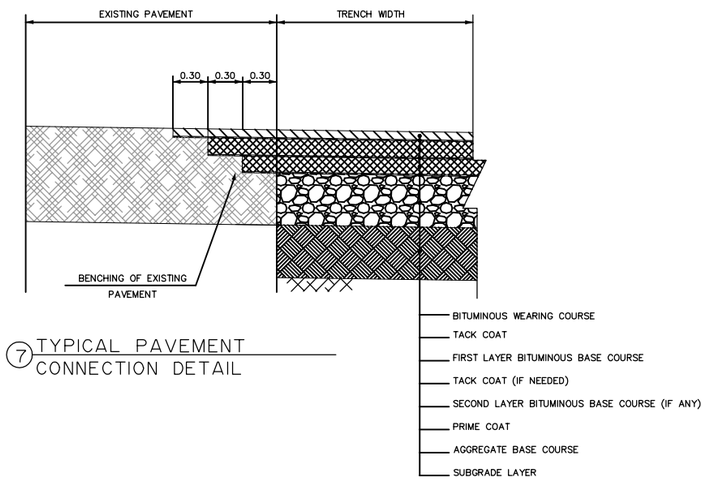
4 CAST-IN PLACE CONCRETE FINISH (PEDESTRIAN)

5 MAIN ROAD - PAVEMENT DETAIL AS PER MOT



6 LOCAL ROAD - PAVEMENT DETAIL AS PER MOT





7 TYPICAL PAVEMENT CONNECTION DETAIL

Design Consultant:

dar

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسم المشروع:
المواصفات الفنية وجداول الكميات القياسية والمخططات لشبكات المياه والصرف الصحي والأعمال الملحقة

Notes:

SEWAGE NETWORK DETAILS

المخططات القياسية لشبكات الصرف الصحي

Drawing Name:

PAVING TYPICAL DETAILS

اسم الخريطة :

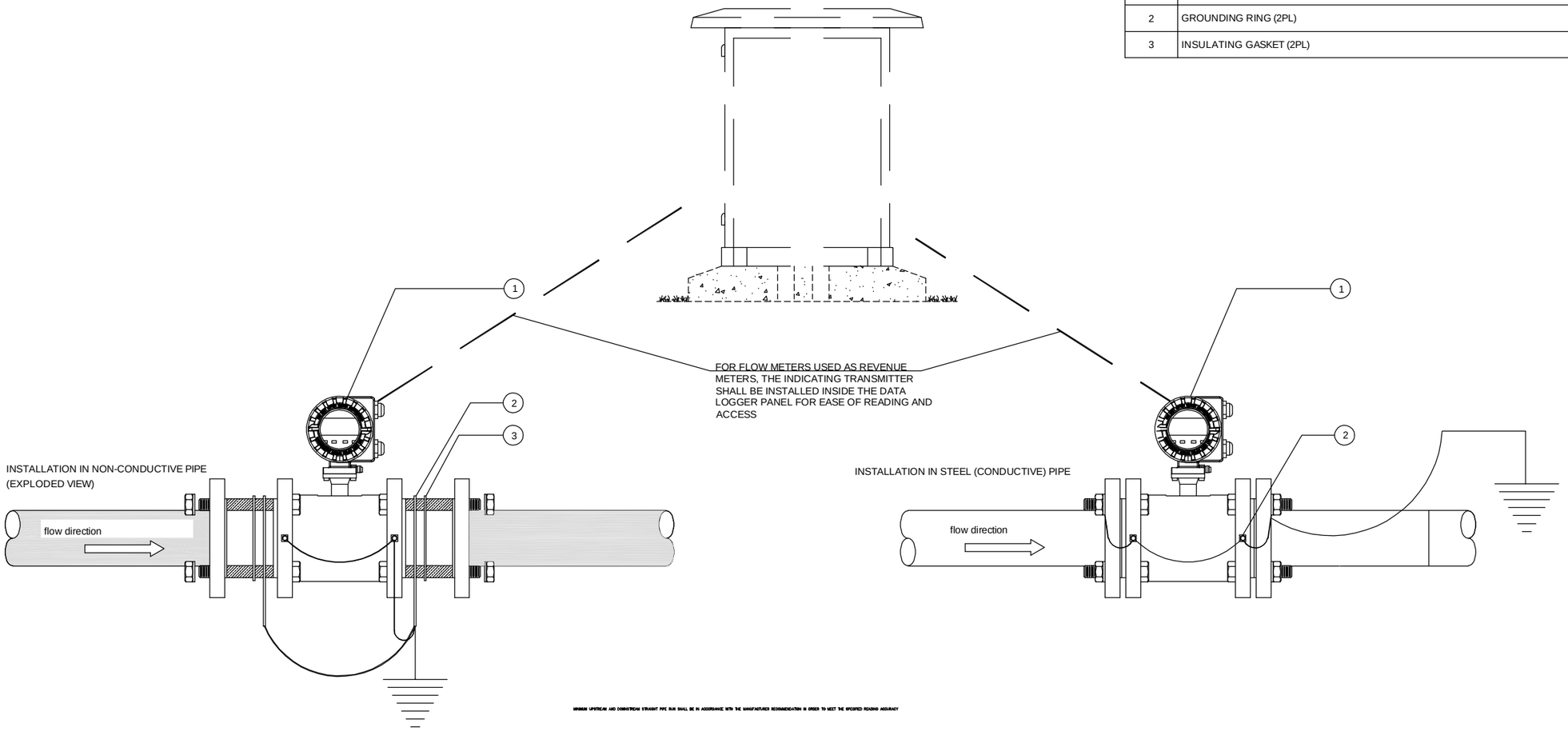
تفاصيل نموذجية لرصف

Project No: S19158

Drawing No: 31

Date: RABI' AL-AWWAL 1442
NOVEMBER 2020

ITEM NO.	DESCRIPTION
1	FLOW METER INCLUDING TRANSMITTER
2	GROUNDING RING (2PL)
3	INSULATING GASKET (2PL)


1
2
3
INSTALLATION IN NON-CONDUCTIVE PIPE
(EXPLODED VIEW)
flow direction
FOR FLOW METERS USED AS REVENUE METERS, THE INDICATING TRANSMITTER SHALL BE INSTALLED INSIDE THE DATA LOGGER PANEL FOR EASE OF READING AND ACCESS
INSTALLATION IN STEEL (CONDUCTIVE) PIPE
flow direction
MINIMUM UPSTREAM AND DOWNSTREAM STRAIGHT PIPE RUN SHALL BE IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATION IN ORDER TO MEET THE SPECIFIED READING ACCURACY

ELECTROMAGNETIC FLOW METER INSTALLATION DETAIL

Design Consultant:

Project Name:
THE SPECIFICATION, BILLS OF QUANTITIES AND TYPICAL DETAILS FOR WATER AND WASTEWATER NETWORKS

اسـم المشـروع:
المواصـفات الفنيـة وجـداول الكميـات القياسـية والمخططـات لشـبكات الميـاه والصـرف الصـحي والأعمـال الملحقـة

Notes:

SEWAGE NETWORK DETAILS

المخططـات القياسـية لشـبكات الصـرف الصـحي

Drawing Name:
ELECTROMAGNETIC
FLOW METER
INSTALLATION DETAIL

اسـم الخريطـة :
تفاصـيل تثبيـت عـداد قيـاس التـدفق الكهرومغناطيسـي

Project No: **S19158**

Drawing No: 33

Date: **RABI' AL-AWWAL 1442**
NOVEMBER 2020